VPDES PERMIT FACT SHEET

This document gives the pertinent information concerning the **reissuance** of the VPDES permit listed below. This permit is being processed as a **minor municipal** permit. The effluent limitations contained in this permit will maintain the Water Quality Standards of 9 VAC 25-260-00 et seq.

The discharge results from the operation of a 0.009 MGD extended aeration wastewater treatment system for Mountain Lake Biological Station. This permit action consists of revising the special conditions. (SIC Code: 4952)

1. Facility Name and Address:

Mountain Lake Biological Station WWTP

335 Salt Pond Road

Pembroke, VA 24136-9724

Location: 335 Salt Pond Road (State Road 668)

2. Permit No: VA0075361 Existing Permit Expiration Date: May 12, 2008

3. Owner/ Facility Contacts: Mr. Julian McCroskey, Plant Operator, (540) 626-7171
Mr. Walter Rogers, Project Manager, (434) 982-4665

4. Application Complete Date: September 17, 2007

Permit Drafted By: Becky L. France, Environmental Engineer Senior

Date: January 23, 2008

DEQ Regional Office: West Central Regional Office

Reviewed By: Kip D. Foster, Water Permit Manager
Reviewer's Signature: Date: 1/28/08
Public Comment Period Dates: From 2/5/08 To 3/5/08

5. Receiving Stream Classification:

Receiving Stream: Hunters Branch, UT (River Mile: 0.20)

River Basin: New River

River Subbasin: None

Section: 1d

Class: VI

Special Standards: None

7-Day, 10-Year Low Flow: 0 MGD
1-Day, 10-Year Low Flow: 0 MGD
1-Day, 10-Year Low Flow: 0 MGD
1-Day, 10-Year High Flow: 0 MGD

Tidal: No 303(d) Listed: No

Attachment A contains a copy of the flow frequency determination memorandum.

- 6. Operator License Requirements: IV
- 7. Reliability Class: I

8.	<u>Pern</u>	<u>uit Characterizat</u>	ion:	
	()	Private	$\overline{()}$	Interim Limits in Other Document
	()	Federal	()	Possible Interstate Effect
	(X)	State		
	(X)	POTW		
	()	PVOTW		

9. <u>Wastewater Treatment System:</u> A description of the wastewater treatment system is provided below. See **Attachment B** for wastewater treatment schematics and **Attachment C** for a copy of the site inspection report. The treatment units associated with the discharge are listed in the table below.

Table I
DISCHARGE DESCRIPTION

Outfall Number	Discharge Source	Treatment (Unit by Unit)	Flow (Design) (MGD)
001	Mountain Lake Biological Station	flow equalization basin extended aeration system clarifiers (2) tablet chlorinator tablet dechlorinator post aeration tank sludge holding tank	0.009 MGD

Mountain Lake Biological Station operates an extended aeration package plant system. This system has a design capacity of 0.009 MGD and receives wastewater from the teaching facility, dining hall, residential cottages, and caretaker's cottage. Grease from the cafeteria is collected in a baffled grease trap. The wastewater works consists of a grit grinder, bar screen, comminuter, aeration basin with two air diffusers, secondary clarifier, and tablet chlorinator, and tablet dechlorinator. After dechlorination, effluent is discharged into an unnamed tributary to Hunters Branch.

- 10. <u>Sewage Sludge Use or Disposal:</u> A VPDES Sewage Sludge Permit Application Form was submitted for this facility to address disposal of sewage sludge from the wastewater treatment facility. Sludge is aerobically digested and periodically transported to the Peppers Ferry Regional Wastewater Treatment Authority for further treatment.
- 11. <u>Discharge Location Description:</u> A USGS topographic map which indicates the discharge location, any significant dischargers, any water intakes, and other items of interest is included in **Attachment D**. The latitude and longitude of the discharge are N 37⁰22'30", E 80⁰31'37".

Name of Topo: Eggleston Number: 112D

- 12. <u>Material Storage:</u> Hydrated lime, calcium hypochlorite tablets, sodium sulfite tablets, and a biological treatment bacterial culture (Water Treat 500) are stored in a small building beside the treatment facility.
- 13. <u>Ambient Water Quality Information:</u> Memoranda or other information which helped to develop permit conditions (special water quality studies, STORET data, and any other biological and/or chemical data, etc.) are listed below.

Mountain Lake Biological Station discharges into an unnamed tributary to Hunters Branch. Hunter's Branch flows into Pond Drain which is a tributary to Little Stony Creek. The discharge is located in the New River/Little Stony Creek Watershed (VAW-N24R) as described in the 2004 Integrated Report Watershed Assessment Unit Summary (Attachment E).

Data for STORET Station 9-LRY000.28 were collected in Little Stony Creek downstream from the discharge point. The instream 90th percentile pH and temperature values for the antidegradation wasteload allocations were determined from these data. Results of a 1997 DEQ benthic survey conducted below the wastewater treatment facility are also included in **Attachment E**.

14.	Antidegradation Review and Comments:	Tier I	Tier II X	Tier III

The State Water Control Board's Water Quality Standards includes an antidegradation policy (9 VAC 25-260-30). All state surface waters are provided one of three levels of antidegradation protection. For Tier I or existing use protection, existing uses of the water body and the water quality to protect these uses must be maintained. Tier II water bodies have water quality that is better than the water quality standards. Significant lowering of the water quality of Tier II waters is not allowed without an evaluation of the economic and social impacts. Tier III water bodies are exceptional waters and are so designated by regulatory amendment. The antidegradation policy prohibits new or expanded discharges into exceptional waters.

The antidegradation review begins with Tier determination. The facility discharges into an intermittent unnamed tributary to Hunters Branch. The intermittent section of Hunters Branch reaches the perennial section of Pond Drain 1.17 miles from the discharge point. The antidegradation review pertains to the perennial section of Pond Drain. This segment of Pond Drain is not listed on Part I of the 303(d) for exceedance of water quality criteria. Available stream data from STORET monitoring station located downstream of the discharge on Little Stony Creek downstream from the confluence with Pond Drain have been compared with the water quality criteria (Attachment F). All pH, dissolved oxygen, and ammonia data were below the water quality criteria. In 1997, a DEQ benthic survey conducted below the wastewater treatment facility found no measurable environmental impact (Attachment E). Based upon these results, this segment is determined to be a Tier II waterbody, and no significant degradation of existing water quality is allowed.

For purposes of aquatic life protection in Tier II waters, "significant degradation" means that no more than 25 percent of the difference between the acute and chronic aquatic criteria values and the existing quality (unused assimilative capacity) may be allocated. For purposes of human health protection, "significant degradation" means that no more than 10 percent of the difference between the human health criteria and the existing quality (unused assimilative capacity) may be allocated. The antidegradation baselines for aquatic life and human health are calculated for each pollutant as follows:

Antidegradation baseline (aquatic life) = 0.25 (WQS - existing quality) + existing quality

Antidegradation baseline (human health) = 0.10 (WQS - existing quality) + existing quality

Where:

"WQS" = Numeric criterion listed in 9 VAC 25-260-5 et seq. for the parameter analyzed "Existing quality" = Concentration of the parameter being analyzed in the receiving stream

When applied, these "antidegradation baselines" become the new water quality criteria in Tier II waters, and effluent limits must be written to maintain the antidegradation baselines for each pollutant. Antidegradation baselines have been calculated as described above and included in **Attachment F**. Stream and effluent data used in the antidegradation wasteload spreadsheet calculations are included in **Attachment E** and **Attachment F**, respectively. The 90th percentile pH and temperature and average hardness values for the perennial segment of Pond Drain are based on STORET data from Station 9-LRY000.28 located downstream from this discharge point. The effluent 90th percentile effluent pH was based upon Discharge Monitoring Report (DMR) data submitted between June 2004 and July 2007.

Antidegradation guidelines are applicable and have been applied to this permit reissuance. Water quality based effluent limits for total residual chlorine (TRC) have been established in compliance with antidegradation requirements set forth in 9 VAC 25-260-30 of the water quality standards regulations. The antidegradation review was conducted as described in Guidance Memorandum 00-2011, and complies with the antidegradation policy contained in Virginia's Water Quality Standards.

- 15. Site Inspection: Date: 6/19/07 Performed by: Becky L. France
 Attachment C contains a copy of the site visit memorandum. The last compliance inspection was conducted by Gerald A. Duff on June 9, 2004.
- 16. <u>Effluent Screening and Limitation Development:</u> DEQ Guidance Memorandum 00-2011 was used in developing all water quality based limits pursuant to water quality standards (9 VAC 25-260-5 et seq). Refer to Attachment F for the wasteload allocation spreadsheet and effluent limit calculations. See Table II on page 12 for a summary of limits and monitoring requirements.

A. Mixing Zone

The receiving stream is an intermittent tributary to Hunters Branch. A mixing zone was not applicable to determining toxic limitations in the intermittent section. This tributary

reaches Pond Drain approximately 1.17 miles from the discharge point. Pond Drain is shown on the topographic map as perennial. Mixing zones may be allowed in perennial waters providing the antidegradation requirements for the waters are met. For the purpose of determining antidegradation baselines for the perennial section, the Agency mixing zone program, MIXER, was run to determine the percentage of the receiving stream flow that could be used in the antidegradation wasteload allocation calculations. The program indicated that 100 percent of the 1Q10 and 7Q10 may be used for calculating the antidegradation acute and chronic wasteload allocations (AWLAs). A copy of the printout from the MIXER run is enclosed in **Attachment F**.

B. Effluent Limitations for Conventional Pollutants

Flow -- The permitted design flow of 0.009 MGD for this facility is taken from the previous VPDES permit and the application for the reissuance. In accordance with the current VPDES Permit Manual, flow is to be estimated and reported per day.

pH -- The pH limits of 6.0 S.U. minimum and 8.2 S.U. maximum have been continued from the November 14, 2000 permit modification. This range is more stringent than the Virginia Water Quality Standards (9 VAC 25-260-50) which is between 6.0 S.U. and 9.0 S.U. The maximum pH limitation was changed to 8.2 S.U. to optimize nitrification and balance that against lower ammonia wasteload allocations calculated from higher pH effluent. Grab samples shall continue to be collected once per day.

Biochemical Oxygen Demand (BOD₅), Dissolved Oxygen (DO) — The BOD₅ and DO limits are continued from the previous permit. These limits are based upon the results of the regional water quality model. The model required an effluent dissolved oxygen concentration of 7.1 mg/L and a maximum effluent BOD₅ of 20 mg/L to be discharged to protect water quality standards. Model coefficients for reaeration, cBOD decay, and nBOD were customized to reflect the characteristics of the shallow, fast moving mountainous stream. Attachment G contains the input data, model outputs, and a summary of the results.

The BOD₅ sampling frequency of weekly has been continued to establish operational performance of the upgraded system during each year's two and a half month operational season.

Total Suspended Solids (TSS) -- TSS limits are technology-based requirements for municipal dischargers of secondary treatment required in accordance with 40 CFR Part 133. These limits of 30 mg/L (1.0 kg/d) monthly average and 45 mg/L (1.5 kg/d) maximum weekly average are the same as the previous permit. Grab samples shall continue to be collected once per month.

C. Effluent Limitations for Toxic Pollutants

Total Residual Chlorine (TRC) -- Since the discharge is into an intermittent stream, the wasteload allocations are equivalent to the water quality criteria. Based on the WLAs and the Agency's STATS program output, the permit limits of 0.007 mg/L monthly average and 0.009 mg/L maximum weekly average have been continued from the previous permit. See **Attachment F** for the WLA spreadsheet. Sampling shall continue to be via grab once per day.

Ammonia as Nitrogen -- The ammonia limit of 1.8 mg/l has been continued from the 2003 permit reissuance. These limits has been based upon water quality criteria prior to revisions to the Water Quality Standards (9 VAC 25-260-00 et seq.) on December 10, 1997. These limits were continued in the 2003 reissuance because backsliding on a limit due to a change in the regulation was not allowed by the VPDES permit regulations. The 2000 permit modification reexamined the ammonia effluent limitations to determine if the modification of the pH limitation would result in a more stringent ammonia limit. For this reevaluation, the modified maximum pH limit of 8.2 S.U. was used as the 90th percentile pH value to determine the new wasteload allocations for ammonia. To predict the potential for instream violations, the wasteload allocations and data evaluated in the 1998 reissuance were inputted into the WLA program. The results of the STATS program demonstrated that ammonia limitations of 3.6 mg/L monthly average and maximum weekly average were needed. However, relaxing the limits would have been considered backsliding. So, the previous effluent ammonia limitations of 1.8 mg/L monthly average and maximum weekly average are being carried forth into the 2008 permit reissuance. Grab samples shall continue to be collected once per month.

- 17. <u>Basis for Sludge Use and Disposal Requirements:</u> Since the facility proposes to pump and haul sludge to a POTW, there are no limits or monitoring requirements associated with sludge use or disposal beyond compliance with the Sludge Management Plan approved with the reissuance of the permit.
- 18. <u>Antibacksliding Statement:</u> Since there are no limitations less stringent than the previous permit, the permit limits comply with the antibacksliding requirements of 9 VAC 25-31-220 L of the VPDES Permit Regulation.
- 19. <u>Compliance Schedules:</u> There are no compliance schedules included in this permit.
- 20. **Special Conditions:** A brief rationale for each special condition contained in the permit is given below.
 - A. Additional Total Residual Chlorine (TRC) Limitations and Monitoring Requirements (Part I.B)

Rationale: This condition requires that the permittee monitor the TRC concentration after chlorine contact. In accordance with 40 CFR 122.41 (e), the permittee is required, at all

times, to properly operate and maintain all facilities and systems of treatment in order to comply with the permit. These requirements ensure proper operation of chlorination equipment to maintain adequate disinfection.

B. 95% Capacity Reopener (Part I.C.1)

<u>Rationale:</u> This condition requires that the permittee address problems resulting from high influent flows, in a timely fashion, to avoid non-compliance and water quality problems from plant overloading. This requirement is contained in 9 VAC 25-31-200 B2 of the VPDES Permit Regulations.

C. CTC, CTO Requirement (Part I.C.2)

Rationale: This condition is required by Code of Virginia § 62.1-44.19; Sewage Collection and Treatment Regulations, 9 VAC 25-790.

D. O&M Manual Requirement (Part I.C.3)

<u>Rationale:</u> Submittal of the manual is required by VPDES Permit Regulation, 9 VAC 25-31-190 E to provide an opportunity for review of current and proposed operations of the facility.

E. Licensed Operator Requirement (Part I.C.4)

Rationale: The VPDES Permit Regulation, 9 VAC 25-200 D and the Code of Virginia §54.1-2300 et seq., Rules and Regulations for Waterworks and Wastewater Works Operators (18 VAC 160-20-10 et seq.), require licensure of operators.

F. Reliability Class (Part I.C.5)

<u>Rationale:</u> A Reliability Class I has been assigned to this facility. Reliability class designations are required by Sewage Collection and Treatment Regulations, 9 VAC 25-790-70 for all municipal facilities.

G. Sludge Reopener (Part I.C.6)

Rationale: This condition is required by VPDES Permit Regulation, 9 VAC 25-31-220 C4 for all permits issued to treatment works treating domestic sewage.

H. Total Maximum Daily Load (TMDL) Reopener (Part I.C.7)

<u>Rationale:</u> Section 303(d) of the Clean Water Act requires that Total Maximum Daily Loads (TMDLs) be developed for streams listed as impaired. This special condition is to allow the permit to be reopened if necessary to bring it into compliance with any applicable TMDL approved for the receiving stream. The reopener recognizes that,

according to Section 402(o)(1) of the Clean Water Act, limits and/or conditions may be either more or less stringent than those contained in this permit. Specifically, they can be relaxed if they are the result of a TMDL, basin plan, or other wasteload allocation prepared under Section 303 of the Act.

I. Compliance Reporting under Part I.A and I.B (Part I.C.8)

Rationale: In accordance with VPDES Permit Regulation, 9 VAC 25-31-190 J4 and 220 I, DEQ is authorized to establish monitoring methods and procedures to compile and analyze data on water quality, as per 40 CFR Part 130, Water Quality Planning and Management, Subpart 130.4. This condition is necessary when toxic pollutants are monitored by the permittee and a maximum level of quantification and/or specific analytical method is required in order to assess compliance with a permit limit or to compare effluent quality with a numeric criterion. This condition also establishes protocols for calculation of reported values.

J. Sludge Use and Disposal (Part I.C.9)

Rationale: VPDES Permit Regulation, 9 VAC 25-31-100 J; 220 B2; and 420 and 720, and 40 CFR Part 503 require all treatment works treating domestic sewage to submit information on sludge use and disposal practices and to meet specified standards for sludge use and disposal. This special condition, in accordance with Guidance Memorandum No. 97-004, clarifies that the Sludge Management Plan approved by the reissuance of this permit is an enforceable condition of the permit.

K. Treatment Works Closure Plan (Part I.C.10)

Rationale: In accordance with State Water Control Law § 62.1-44.19, this condition is used to notify the owner of the need for a closure plan where a treatment works is being replaced or is expected to close.

L. Conditions Applicable to All VPDES Permits (Part II)

<u>Rationale:</u> VPDES Permit Regulation, 9 VAC 25-31-190 requires all VPDES permits to contain or specifically cite the conditions listed.

21. Changes to the Permit:

A. The following special condition has been deleted from the permit:

The Bacterial Effluent Limitations and Monitoring Requirements Special Condition (Part I.B) has been removed because the requirements of the bacterial study have been completed.

- B. Special conditions that have been modified from the previous permit are listed below: (The referenced permit sections are for the new permit.)
 - 1. The Additional Total Residual Chlorine Limitations and Monitoring Requirements Special Condition (Part I.B) has been revised to reflect changes in the Water Quality Standards.
 - 2. The O&M Manual Special Condition (Part I.C.3) has been revised in accordance with the VPDES Permit Manual.
 - 3. A Compliance Reporting under Part I.A and I.B Special Condition (Part I.C.8) has been revised to include information about significant figures.
- C. A new special conditions added to the permit is listed below:

A CTC, CTO Requirement Special Condition (Part I.C.2) has been added in accordance with the VPDES Permit Manual.

- D. Permit Limits and Monitoring Requirements: There are no changes in the permit limits or monitoring conditions in Part I.A.
- 22. Variances/Alternate Limits or Conditions: No variances or alternate limits or conditions are included in this permit. For the application, the permittee requested a waiver to allow the submission of E. coli data collected during the permit term in lieu of fecal coliform data. The permittee also requested that the grab analysis data for TSS and BOD₅ collected during the permit term be used in the application in lieu of composite samples. These waivers were consistent with current permit requirements, and therefore they were granted.
- 23. Regulation of Treatment Works Users: The VPDES Permit Regulation, 9 VAC 25-31-280 B9, requires that every permit issued to a treatment works owned by a person other than a state or municipality provide an explanation of the Board's decision on the regulation or users. The state of Virginia through University of Virginia, owns this treatment works; therefore this regulation does not apply.
- 24. Public Notice Information required by 9 VAC 25-31-290 D:

All pertinent information is on file and may be inspected, and arrangements made for copying by contacting Becky L. France at:

Virginia DEQ West Central Regional Office 3019 Peters Creek Road Roanoke, VA 24019 540-562-6700 blfrance@deq.virginia.gov Persons may comment in writing or by e-mail to the DEQ on the proposed permit action and may request a public hearing during the comment period. Comments shall include the name, address, and telephone number of the writer, and shall contain a complete, concise statement of the factual basis for comments. Only those comments received within this period will be considered. The DEQ may decide to hold a public hearing if public response is significant. Requests for public hearings shall state the reason why a hearing is requested, the nature of the issues proposed to be raised in the public hearing, and a brief explanation of how the requester's interests would be directly and adversely affected by the proposed permit action.

Following the comment period, the DEQ will make a determination regarding the proposed permit action. This determination will become effective, unless the DEQ grants a public hearing. Due notice of any public hearing will be given.

25. <u>303(d) Listed Segments (TMDL):</u> This facility discharges to an unnamed tributary of Hunters Branch. This stream segment receiving the effluent is not listed on the current 303(d) list; and therefore no Total Maximum Daily Loads (TMDLs) have been or are being developed for this segment.

26. Additional Comments:

A. Reduced Effluent Monitoring: Guidance Memorandum 98-2005 allows for reduced monitoring at facilities with excellent compliance histories. To qualify for consideration of reduced monitoring, the facility should not have been issued any Letter of Noncompliance (LON), Notice of Violation (NOV), or Warning Letter, or be under any Consent Orders, Consent Decrees, Executive Compliance Agreements, or related enforcement documents during the past three years.

The facility received a received a warning letter as follows:

W2006-07-W-1033 laboratory inspection deficiencies at Prochem Analytical, Inc.

In accordance with Guidance Memorandum 98-2005, the facility is not considered eligible for reduced monitoring evaluation. Also, this facility only operates two and a half months out of the year, so reduction in monitoring frequency may not be applicable.

- B. Previous Board Action: None
- C. Staff Comments: The discharge is not controversial. The discharge is not addressed in any planning document, but will be included if applicable when the plan is updated. The permit is being reissued for a period of less than five years to even out the DEQ staff permit writing workload.
- D. **Public Comments:** No comments were received during the comment period.

E. Tables

Table I Discharge Description (Page 2)

Table II Basis for Monitoring Requirements (Page 12)

F. Attachments

- A. Flow Frequency Memorandum
- B. Wastewater Schematic
- C. Site Inspection Report
- D. USGS Topographic Map
- E. Ambient Water Quality Information
 - STORET Data (Station 9-LRY000.28)
 - 2004 Integrated Report Watershed Assessment Unit Summary (Excerpt)
 - 1997 Benthic Survey (Hunters Branch, UT)
- F. Wasteload and Limit Calculations
 - Mixing Zone Calculations (MIXER 2.1)
 - Effluent Data
 - Wasteload Allocation Spreadsheet
 - Antidegradation Wasteload Allocation Spreadsheet
 - STATS Program Results (ammonia as N)
- G. Water Quality Model Calculations
- H. Public Notice
- I. EPA Checksheet

Table II
BASIS FOR LIMITATIONS – MUNICIPAL

() Interim Limitations (x) Final Limitations

OUTFALL: 001 DESIGN CAPACITY: 0.009 MGD

Effective Dates - From: Effective Date To: Expiration Date

		α	DISCHARGE LIMITS			MONITORING	MONITORING REQUIREMENTS
PARAMETER	BASIS FOR LIMITS	Monthly Average	Weekly Average	Minimum	Maximum	Frequency	Sample Type
Flow (MGD)	NA	TN	٧٧	NA A	N	L/Day	Estimate
pH (Standard Units)	1,2	ΥN	NA	0.9	8.2	1/Day	Grab
BOD;	4	20 mg/L 0.68 kg/d	30 mg/L 1,0 kg/d	NA	NA	1/Week	Grab
Total Suspended Solids	1	30 mg/L 1.0 kg/d	45 mg/L 1.5 kg/d	NA	NA	1/Month	Grab
Dissolved Oxygen	3,4	NA	NA	7.1 mg/L	Ϋ́	1/Day	Grab
Total Residual Chlorine	3	0.007 mg/L	0.009 mg/L	NA	NA	1/Day	Grab
Ammonia as Nitrogen	ęn.	1.8 mg/L	1.8 mg/L	NA	NA	1/Month	Grab

NA = Not Applicable NL = No Limitations; monitoring only

The basis for the limitations codes are:
1. Federal Technology-Based Secondary Treatment Regulation (40 CFR Part 133)
2. Best Professional Judgment
3. Water Quality Criteria
4. Regional Water Quality Model

E. Tables

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- H. Public Notice
- I. EPA Checksheet

Attachment A Flow Frequency Memorandum

MEMORANDUM

DEPARTMENT OF ENVIRONMENTAL QUALITY - WATER DIVISION 3019 Peters Creek Road, Roanoke, Virginia 24017

SUBJECT: Flow Frequency Determination

Mountain Lake Biological Station WWTP - Reissuance (VA0075361)

TO:

Permit File

FROM:

Becky L. France, Environmental Engineer Senior

DATE:

December 11, 2007

COPIES:

This memorandum supersedes the October 24, 2002 memorandum from Paul E. Herman concerning the subject VPDES permit.

Mountain Lake Biological Station discharges to an unnamed tributary of Hunter Branch near Mountain Lake, Virginia. Stream flow frequencies are required at this site to develop effluent limitations for the VPDES permit.

At the discharge point, the receiving stream is shown to be a dry ravine on the USGS Eggleston Quadrangle topographic map. The dry ravine drains to an intermittent stream. The flow frequencies for intermittent streams are 0.0 cfs for 1Q10, 7Q10, 30Q5, high flow 1Q10, high flow 7Q10, and the harmonic mean.

For determination of antidegradation baseline, flow frequencies are also needed for the Pond Drain above the confluence with Hunters Branch. They were estimated using the USGS continuous record gauge on Wolf Creek near Narrows, Virginia (#03175500) that has operated since 1908. The gauge is located at the Route 724 bridge, in Giles County, Virginia. The flow frequencies for the gauge and the discharge point are presented below. The values at the perennial point were determined by drainage area proportions and do not address any other discharges, withdrawals, or springs lying upstream. The high flow months are January through May. Flow frequencies for the perennial section are given on the attached table.

Flow Frequency Determination: Mountain Lake Biological Station WMTP

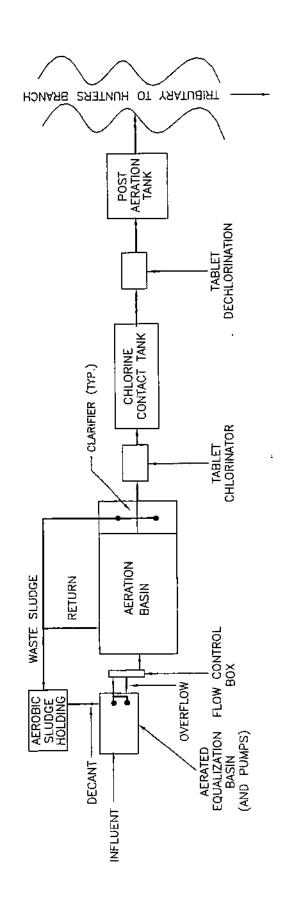
							_
			MGD	19	23	5	38
			tt³/s	59	36	95	99
keference Gauge (data from 1908 -1916, 1938-2003) Volf Creek at Roanoke, VA (#03175500)	Drainage Area [mi ²] = 223		High Flow 1Q10 =	High Flow 7Q10 =	= WH	High Flow 3010=	
		MGD	11	4	20	17	
		ft³/s	17	2	3	27	
Reference G	Wolf Creek a	_		1010=	7Q10 =	3005=	30⊈10≂

Pond Drain	above Hun	Pond Drain above Hunters Branch	·		
_	Drainage Area [mi²] =	ea [mi²] =	1.8		
	ft³/s	MGD		ft³/s	MGD
1010=	0.14	60'0	High Flow 10,10 =	0.23	0.15
7010 ≖	0.17	0.11	High Flow 7Q10 =	0.29	0.19
3005=	0.25	0.16	H WH	0.77	0.50
30010=	0.22	0,14	High Flow 30Q10=	0.48	0.31

IN NOTES	Year is not	a complete	year
T YRSTE			2005
STATPERIO		1908-1916,	1938-2003
HFWTHS			DEC-MAY
Z1030			5
21010			4
0 2701			<u>2</u>
5 173001			27
10 Z300			34
TO HETO			73
0 HF7Q			36
AN HE30Q			9
A HARME			95
DAARE			223
RECORD		R, 1908-1916,	1938-
NAME		Wolf Creek at R, 1908-1916,	Narrows, Va. 1938-
SITEID			03175500

Attachment B

Wastewater Schematic



MOUNTAIN LAKE BIOLOGICAL RESEARCH STATION WASTEWATER TREATMENT PLANT FLOW DIAGRAM FIGURE 1

AND ASSOCIATES, Inc.

Engineers Surveyors Planners

Blacksburg, VA Greensborg, NC Middletown, VA Richmond, VA Tri-Cities, IN

DOCUMENT NO. 01 18202-031 DEC DATE <u>ک</u> N.T.S. SCALE DRAWN AFW

Attachment C Site Inspection Report

MEMORANDUM

DEPARTMENT OF ENVIRONMENTAL QUALITY West Central Regional Office

3019 Peters Creek Road

Roanoke, VA 24019

SUBJECT:

Site Inspection Report for Mountain Lake Biological Station

Reissuance of VPDES Permit No. VA0078361

TO:

Permit File

FROM:

Becky L. France, Environmental Engineer Senior

CC:

Samuel C. Hale, Environmental Inspector Supervisor

DATE:

June 20, 2007

On June 19, 2007, I conducted a site inspection of the wastewater works for Mountain Lake Biological Station. Mr. Julian McCroskey, caretaker for the extended aeration facility, was present at the inspection. Mountain Lake Biological Station is located at the end of State Road 668 in Giles County, Virginia. There is one drinking water well onsite that serves the research facilities and residences.

Location of Discharge/ Description of Receiving Waters/ Stream Uses

Effluent is discharged from a 12-inch PVC pipe into an intermittent tributary to Hunters Branch. The tributary is fed by spring water and groundwater infiltration. The shallow, are shaped stream bed has a silty bottom. Hunters Branch feeds into Pond Drain which flows into Little Stony Creek. This area is a wildlife preserve, and there are no other dischargers in the vicinity. The area is used primarily for recreation and as a wildlife research station. The discharge flows into tributaries that drain into Little Stony Creek which is a stockable trout stream. Jefferson National Forest and Cascades Recreational Area are located downstream of this discharge point.

Familiarization with Plant Operations

Mountain Lake Biological Station operates seasonally, from approximately June to mid-August each year. Wastewater from the teaching facility, dining hall, residential cottages, and caretaker's cottage is treated by an extended aeration package plant system that operates during this same period. At the time of the site visit the treatment facility was serving a population of approximately 67 people. Due to the seasonal nature of the station, the wastewater treatment system is pumped and shut down each year. The small amount of wastewater generated from the reduced nonseasonal flow is handled by a septic system with a drainfield.

The extended aeration system consists of a bar screen, equalization basin with aerator unit, aeration basin with three air diffusers, sludge holding tank with aerator unit, 2 clarifiers, tablet chlorinator with baffled chlorine contact chamber, dechlorinator, and post aeration tank with aerator. Materials trapped in the bar screen are removed daily, stored in a dumpster, and taken to a landfill biweekly. A baffled grease trap is designed to handle grease from the dining hall.

An equalization basin has been added due to the highly variable flow. During periods of high flow, an overflow pipe will route overflow back to the equalization basin. The pH is checked each morning and hydrated lime manually added as needed. To assist in the removal of ammonia, nitrifying microorganisms and enzymes are added to the treatment works daily.

Site Inspection Report Mountain Lake Biological Station June 20, 2007 Page 2

During the site visit, no foam or froth was observed in the aeration basin. The activated sludge was a good chocolate color and had no odor. Wastewater from the activated sludge basin flows into the clarifier.

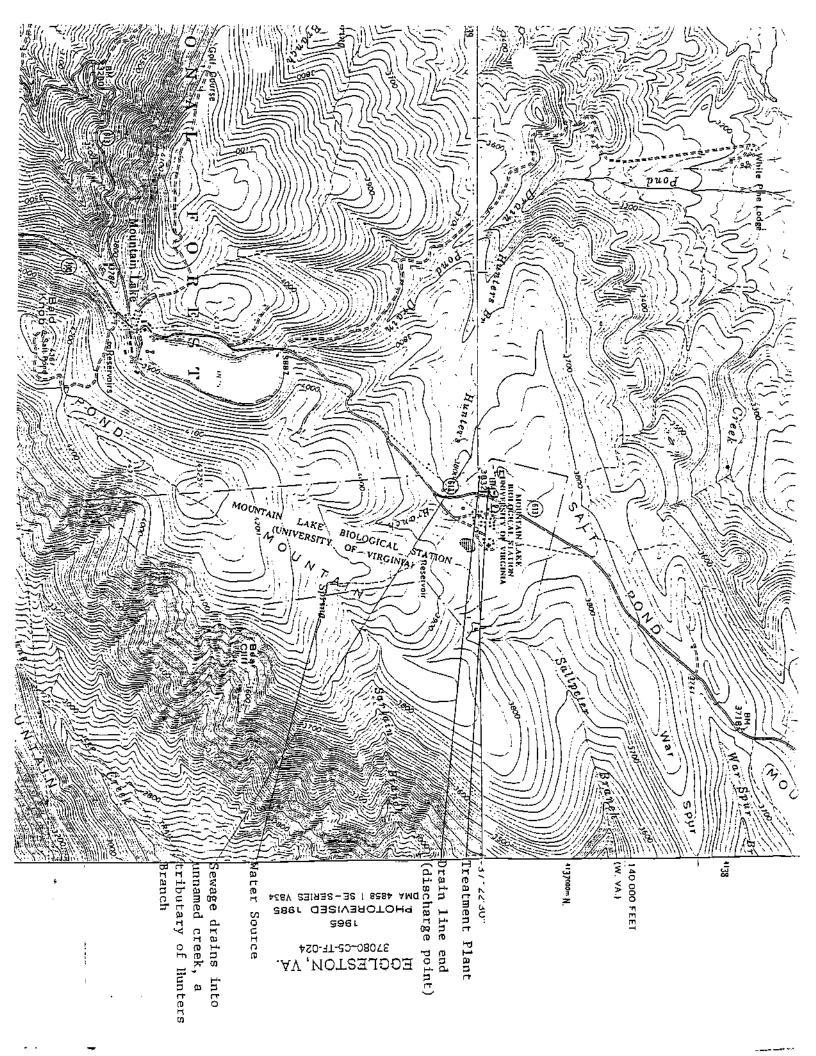
The clarifier tank has one hopper with an air pump for sludge return. Any excess sludge is pumped to an aerated sludge holding basin. This sludge basin is pumped periodically as needed, and the sludge is transported by a contract waste hauler to a conventional wastewater treatment plant. At the time of the site visit, the sludge was settling well. Solids did not seem to be carried over the weir.

The wastewater from the extended aeration system flows to the disinfection system, which includes a tablet chlorinator, baffled chlorine contact chamber, and a tablet dechlorinator. At the time of the site visit, one tube with calcium hypochlorite tablets was being used for disinfection and two tubes with sodium sulfite tablets were being used for dechlorination. Disinfected effluent flows into a post aeration tank which contains three flexible fine bubble membrane tube diffusers. Following aeration, the effluent is discharged to an unnamed tributary of Hunters Branch.

Effluent Monitoring

Total residual chlorine (TRC), dissolved oxygen (DO), and pH are tested onsite. A NSI thermometer, HACH pocket colorimeter, HSI 55 DO meter and Orion pH test meter are used for these analyses. Total Suspended Solids (TSS), ammonia, and BOD₅ testing are performed by a contract laboratory. A copy of the O&M Manual approved on March 1, 2001 was onsite at the time of the site visit.

Attachment D USGS Topographic Map



Attachment E

Ambient Water Quality Information

- STORET Data (Station 9-LRY000.28)
- 2004 Integrated Report Watershed Assessment Report Unit Summary (Excerpt)
- 1997 Benthic Survey (Hunters Branch, UT)

2004 Integrated Report Watershed Assessment Unit Summary

VAW-N24R

OVERALL 2004 WATERSHED SUMMARY *

Total Watershed Size:

57.69 MILES

NEW RIVER/LITTLE STONY CREEK

Total Assessment Units: 13

Federal Category 5 Waters Waters 'Impaired' requiring TMDL Studies

Federal Categories 4A & 4C Waters

No further TMDL Study required

'Impaired' for one or more parameters

Believed Natural

One TMDL complete one or more remains Waters 'Impaired' TMDL complete

Waters 'Impaired' Natural

(VA Subcategories) Impaired Waters:

5A 11.68 5C

4A

4C

non-DEQ Data Method Collection

3D

Existing Data

and/or Laboratory not QA/QC'd

Use Not Attained

Federal Category 3 Waters

Insufficient to No Data

Assess 'Waters of Concern'

(VA Subcategories) Insufficient Data:

3A 41.29

Use Attained 3B 3C

Federal Category 1 Waters

Federal Category 2 Waters Fully Supports Assessed Uses

Fully Supports but are 'Waters of Concern'

'Fully Supports all Uses'

(VA Subcategories) Support Some Uses:

2A 4.72 2B

(VA Subcategories)

Supports All Uses:

* Note: Totals are based on Overall AU Category.

2004 Integrated Report Watershed Assessment Unit Summary

Watershed ID: VAW-N24R NEW RIVER/LITTLE STONY CREEK

Assessment Unit (AU)	TMDL ID	Overall AU Category	Stream & AU Description	AU S	ize
VAW-N24R_D0E01A00			m waters of Doe Creek from its confluence on the New ostream to its headwaters.	6.80	MILES
VAW-N24R_HNB01A04			Branch mainstem from its headwaters downstream to uence on Pond Drain.	1.64	MILES
VAW-N24R_LCR01A00			Creek mainstem from its confluence on Little Stony pstream to its headwaters.	3.13	MILES
VAW-N24R_LRY01A00	VAW-N24R-01	the Nev	m waters of Little Stony Creek from its confluence on River upstream to the first unnamed tributary at ke, Virginia.	2.06	MILES
VAW-N24R_LRY02A00			ony mainstem from the first unnamed tributary at ke, Virginia upstream to the mouth of Hemlock Branch.	4.72	MILES
VAW-N24R_LRY03A00		3A Little St Branch	ony Creek mainstem from the mouth of Hemlock upstream to its headwaters.	5.77	MILES
VAW-N24R_LRY03B04		3A Headwa	ter tributaries to Little Stoney Creek.	5.77	MILES
VAW-N24R_NEW01A00	VAW-N22R-01		ver mainstern from the confluence of Stony Creek m to the mouth of Walker Creek on the New River.	3.81	MILES
VAW-N24R_NEW02A00	VAW-N22R-01		ver mainstem waters from the mouth of Walker Creek m to the confluence of Little Stony Creek with the New	1.95	MILES
VAW-N24R_NEW03A00	VAW-N22R-01		ver mainstem waters from the confluence of Little reek upstream to mouth of Sinking Creek on the New	3.86	MILES
VAW-N24R_PDD01A04			rain mainstem from Mountain Lake downstream to its nce on Little Stony Creek.	2.42	MILES
VAW-N24R_ZZZ01A00		3A Remain	ing waters in watershed N24R.	12.37	MILES
VAW-N24R_ZZZ02A02		3A Tributar	ies to Little Stony Creek.	3.39	MILES

VDH Fish Consumption Advisory for Carp. Issued 8/06/01. Carp caught in these waters should not be consumed. Advisory extends from the Rt. 114 Bridge (Pulaski, Montgomery Counties) downstream to the VA / WVA State Line (Giles County), a total of 52 miles. VDH Level of concern 600 ppb. PCB in Carp at Whitethrone 686 ppb; PCB in Carp at Glen Lyn 3,259 ppb: Complete VDH Fish Consumption Advisory Listing at

stations 9-NEW056.22 (AQ), 9-NEW055.51 ('01 Sed) and 9-NEW050.70 ('02 FT/Sed). 9-NEW056.22- One FC sample of 51 exceeds the WQS instantaneous criterion 400 at 600 cfull on H- Full Support. One pH observation of 51 exceeds at 9.13 SU- Full Support. No exceedances of DO, Temp, TP, chlorophyli a or NH3-N all Fully Support. AQ 2000 sediment Fully Supports. AQ 1998 sediment exceeds PEC SV zinc (Zn) SV 459 ppm at 480- 'Observed Effect'. 9-NEW055.51- No sediment exceedances of PEC PCB SV of 676 ppb. 9-NEW050.70- WQS fish tissue exceeds TVs [Table 6(a)] Total fish analyzed 48: 2002 - 3 Carp PCB (TV 54 ppb) at 532, 398, 411 ppb; Total Carp analyzed 3; and 1 Flathead Catfish at 54 ppb- Total Flathead Catfish analyzed 10. 2001 - 2 Carp PCB at 2394 and 2310 ppb; Total Carp analyzed 2; and 1 Flathead Catfish at 89 ppb; Total Flathead Catfish analyzed 3. 2001 - 2 Carp DDE (TV 320 ppb) at 355 and 326 ppb; Total Carp analyzed 2. 2001 - 2 Carp DDT (TV 320 ppb) at 359 and 373 ppb; Total Carp analyzed 2. 9-NEW050.70- WQS 2001 FT exceeds TSVs [Table 6(b)] for: 2001 - 2 Carp Heptachlor epoxide (TSV 10 ppb) at 54 ppb each; Total Carp analyzed 2- Observed Effect. 9-NEW050.70- WQS 2002 and 2001 Sediment do not exceed any PEC SVs.

AU ID: VAW-N24R NEW02A00 1.95 M

AU Overall Category: 5A

LOCATION: New River mainstem waters from the mouth of Walker Creek upstream to the confluence of Little Stony Creek with the New River.

State TMDL ID	Use	WOS Attainment	303(d) Impairment Initial List Year
	Aquatic Life	Fully Supporting	
VAW-N22R-01	Fish Consumption	Not Supporting	
	303(d) Parameter.	DDT	2004
		Polychlorinated biphenyls	2002
		DDE	2004
	Recreation	Fully Supporting	
	Wildlife	Fully Supporting	

WQS Class IV Sec. 1 u

VDH Fish Consumption Advisory for Carp. Issued 8/06/01. Carp caught in these waters should not be consumed. Advisory extends from the Rt. 114 Bridge (Pulaski, Montgomery Counties) downstream to the VA / WVA State Line (Giles County), a total of 52 miles. VDH Level of concern 600 ppb. PCB in Carp at Whitethrone 686 ppb; PCB in Carp at Glen Lyn 3,259 ppb. Complete VDH Fish Consumption Advisory Listing at

stations 9-NEW056.22 (AQ) 9-NEW055.51 ('01 Sed) and 9-NEW050.70 ('02 FT/Sed) 9-NEW056.22- One FC sample of 51 exceeds the WQS instantaneous criterion 400 at 600 cfu/100 ml- Full Support. One pH observation of 51 exceeds at 9.13 SU- Full Support. No exceedances of DO, Temp, TP, chlorophyll a or NH3-Nail Fully Support. AQ 2000 sediment Fully Supports. AQ 1998 sediment exceeds PEC SV zinc (Zn) SV 459 ppm at 480- 'Observed Effect'. 9-NEW055.51- No sediment exceedances of PEC PCB SV of 676 ppb. 9-NEW050.70- WQS fish tissue exceeds TVs [Table 6(a)] Total fish analyzed 48: 2002 - 3 Carp PCB (TV 54 ppb) at 532, 398, 411 ppb; Total Carp analyzed 3; and 1 Flathead Catfish at 54 ppb- Total Flathead Catfish analyzed 2; and 1 Flathead Catfish at 89 ppb; Total Flathead Catfish analyzed 3. 2001 - 2 Carp PCB (TV 320 ppb) at 355 and 326 ppb; Total Carp analyzed 2. 2001 - 2 Carp DDT (TV 320 ppb) at 359 and 373 ppb; Total Carp analyzed 2. 9-NEW050 70- WQS 2001 FT exceeds TSVs [Table 6(b)] for: 2001 - 2 Carp Heptachior epoxide (TSV 10 ppb) at 54 ppb each; Total Carp analyzed 2- 'Observed Effect'. 9-NEW050.70- WQS 2002 and 2001 Sediment do not exceed any PEC SVs.

VAW-N24R_NEW01A00 AU ID:

3.81 M

AU Overall Category: 5A

303(d) Impairment

LOCATION: New River mainstem from the confluence of Stony Creek upstream to the mouth of Walker Creek on the New River.

State TMDL ID	Use	WOS Attainment	Initial List Year
VAW-N22R-01	Aquatic Life Fish Consumption	Fully Supporting Not Supporting	
	303(d) Parameter:	DDE	2004
		Polychlorinated biphenyls	2002
		DDT	2004
	Recreation	Not Assessed	
	Wildlife	Not Assessed	

VDH Fish Consumption Advisory for Carp. Issued 8/06/01. Carp caught in these waters should not be consumed. Advisory extends from the Rt. 114 Bridge (Pulaski, Montgomery Counties) downstream to the VA / WVA State Line (Giles County), a total of 52 miles. VDH Level of concern 600 ppb. PCB in Carp at Whitethrone 686 ppb; PCB in Carp at Glen Lyn 3,259 ppb, Complete VDH Fish Consumption Advisory Listing at stations 9-NEW050.70 (02 FT/Sed) and 9-NEW044.94 ('01 Sed). 9-NEW050.70- WQS fish tissue exceeds TVs [Table 6(a)] Total fish analyzed 48: 2002 - 3 Carp PCB (TV 54 ppb) at 532, 398, 411 ppb; Total Carp analyzed 3; and 1 Flathead Catfish at 54 ppb- Total Flathead Catfish analyzed 10. 2001 - 2 Carp PCB at 2394 and 2310 ppb; Total Carp analyzed 2; and 1 Flathead Catfish at 89 ppb; Total Flathead Catfish analyzed 3. 2001 - 2 Carp DDE (TV 320 ppb) at 355 and 326 ppb; Total Carp analyzed 2. 2001 - 2 Carp DDT (TV 320 ppb) at 359 and 373 ppb; Total Carp analyzed 2. 9-NEW050.70-WQS 2001 FT exceeds TSVs [Table 5(b)] for: 2001 - 2 Carp Heptachlor epoxide (TSV 10 ppb) at 54 ppb each; Total Carp analyzed 2- 'Observed Effect'. 9-NEW050.70- WQS 2002 and 2001 Sediment do not exceed any PEC SVs. 9-NEW044.94- No sediment exceedances of PEC PCB SV of 676 ppb.

VAW-N24R LRY03B04 AU ID:

5.77 M

AU Overall Category: 3A

LOCATION: Headwater tributaries to Little Stoney Creek.

State TMDL ID

Use

WOS Attainment

303(d) Impairment Initial List Year

Aquatic Life

Not Assessed

Fish Consumption

Not Assessed

Recreation

Not Assessed

Wildlife

Not Assessed

WQS Class VI Sec. 1d u No current data. These waters are not assessed.

No VDH fish consumption advisory.

AU ID: VAW-N24R_LRY03A00 5.77 M

AU Overall Category: 3A

LOCATION: Little Stony Creek mainstem from the mouth of Hemlock Branch upstream to its headwaters.

State TMDL ID

Use

WOS Attainment

303(d) Impairment Initial List Year

303(d) Impairment

Initial List Year

Aquatic Life

Not Assessed

Fish Consumption

Not Assessed

Recreation

Not Assessed

Wildlife

Not Assessed

WQS Class VI Sec. 1d_u_No current data. These waters are not assessed. No VDH fish consumption advisory.

AU ID:

VAW-N24R LRY02A00

4.72 M

AU Overall Category: 2A

LOCATION: Little Stony mainstem from the first unnamed tributary at Pembroke, Virginia upstream to the mouth of Hemlock

State TMDL ID

Use

WOS Attainment

Aquatic Life

Fully Supporting

Fish Consumption

Not Assessed

Recreation

Not Assessed

Wildlife

Not Assessed

WQS Class Vi Sec. 1d u

Assessment basis: Citizen MAiS station 9LRY-SOS. USFS MAIS station 8003. USFS observations of pH are unassessed due to noncompliance w/ EPA sampling protocols. 8003- Bio 'NI'; not impaired. Single Survey '99 MAIS score 18 Very Good. 9-LRY004.64- Bio 'NI'; not impaired. Single 2001 RBP II survey score 100. Little Stony Creek is a third order stream within the National Forest (Blacksburg Ranger District). This station was sampled to assess the water quality and biological community in regard to the nomination of the stream as an Exceptional State Water (Tier III designation) by several groups (Trout Unlimited, Friends of the New River, and Friends of the Rivers of Virginia). Based on the benthic macroinvertebrate survey, this stream has excellent water quality and a diverse assemblage of pollution sensitive organisms. Single observations of DO, Temp and pH find no exceedances but are not assessed. 9LRY-SOS-"LP"; Low Probability of adverse conditions. One Traditional Method survey, Good- insufficient to assess. No VDH fish consumption advisory.

Watershed ID: VAW-N24R

Total Watershed Size:

57.69 M

AU ID:

VAW-N24R ZZZ02A02

3.39 M

AU Overall Category: 3A

LOCATION: Tributaries to Little Stony Creek.

303(d) Impairment Initial List Year

Aquatic Life

Use

Not Assessed Not Assessed

WOS Attainment

Fish Consumption Recreation

Not Assessed

Wildlife

State TMDL ID

State TMDL ID

WQS Class VI Sec. 1d. u... No current data. These waters are not assessed.

Not Assessed No VDH fish consumption advisory.

AU ID:

VAW-N24R ZZZ01A00

12.37 M

AU Overall Category: 3A

LOCATION: Remaining waters in watershed N24R.

WOS Attainment

303(d) Impairment Initial List Year

Aquatic Life

Not Assessed

Fish Consumption

Use

Not Assessed Not Assessed

Recreation Wildlife

Not Assessed

WQS Class IV Sec. 1 u No current data. These waters are not assessed. No VDH fish consumption advisory.

AU ID:

VAW-N24R PDD01A04

2.42 M

AU Overall Category: 3A

LOCATION: Pond Drain mainstem from Mountain Lake downstream to its confluence on Little Stony Creek.

303(d) Impairment

State TMDL ID

Use

WOS Attainment

Initial List Year

Aquatic Life

Not Assessed

Fish Consumption

Not Assessed

Recreation

Not Assessed

Wildlife

Not Assessed

WQS Class VI Sec. 1d. u. No current data. These waters are not assessed. No VDH fish consumption advisory.

AU ID:

VAW-N24R_NEW03A00

3.86 M

AU Overall Category: 5A

New River mainstern waters from the confluence of Little Stony Creek upstream to mouth of Sinking Creek on the

New River.

State TMDL ID

Use

WOS Attainment

303(d) Impairment

Aquatic Life

Fully Supporting

Initial List Year

VAW-N22R-01

Fish Consumption

Not Supporting

2002

303(d) Parameter:

Polychiorinated biphenyls

DDE

DDT

2004 2004

Recreation

Fully Supporting

Wildlife

Fully Supporting

VAW-N24R LRY01A00 AU ID:

2.06 M

AU Overall Category: 5A

LOCATION: Mainstern waters of Little Stony Creek from its confluence on the New River upstream to the first unnamed tributary

at Pembroke, Virginia.

303(d) Impairment

State TMDL ID

Use

WOS Attainment

Initial List Year

Aquatic Life

Fully Supporting

Fish Consumption

Not Assessed

VAW-N24R-01

Recreation

Not Supporting

303(d) Parameter:

Total Fecal Coliform

2002

Wildlife

Fully Supporting

WQS Class VI Sec. 1d u

Assessment basis: DEQ Stations 9-LRY000.28 (AQ) 9-LRY000.28- Two of 14 FC observations exceed the 400 cfu/100 ml WQS instantaneous criterion. Exceedances are 500 and 1800 cfu/100 ml. No excursions of the PEC SVs are found in sediment from AQ 2000 and 1999 collections, 1998 AQ sediment finds lead (Pb) exceeding the PEC SV 128 ppm at 190- 'Observed Effect'. DO, Temp, pH, TP, chlorophyll a and NH3-N all Fully Support. No VDH fish consumption advisory.

AU ID:

VAW-N24R LCR01A00

3.13 M

AU Overall Category: 3A

LOCATION: Laurel Creek mainstem from its confluence on Little Stony Creek upstream to its headwaters.

303(d) Impairment

State TMDL ID

Use

WOS Attainment

Initial List Year

Aquatic Life

Not Assessed

Fish Consumption

Not Assessed Not Assessed

Recreation Wildlife

Not Assessed

WQS Class VI Sec. 1d_u No current data. These waters are not assessed. No VDH fish consumption advisory.

AU ID:

VAW-N24R_HNB01A04

1.64 M

AU Overall Category: 3A

LOCATION: Hunters Branch mainstem from its headwaters downstream to its confluence on Pond Drain.

303(d) Impairment

State TMDL ID

Use

WOS Attainment

Initial List Year

Aquatic Life

Not Assessed

Fish Consumption

Not Assessed

Recreation

Not Assessed

Wildlife

WQS Class VI Sec. 1d u No current data. These waters are not assessed.

Not Assessed No VDH fish consumption advisory.

AU ID:

VAW-N24R_DOE01A00

6.80 M

AU Overall Category: 3A

LOCATION: Mainstern waters of Doe Creek from its confluence on the New River upstream to its headwaters.

303(d) Impairment

State TMDL ID

Use

WOS Attainment

Initial List Year

Aquatic Life

Not Assessed

Fish Consumption

Not Assessed

Recreation Wildlife

Not Assessed Not Assessed

WQS Class IV Sec. 1 u No current data. These waters are not assessed. No VDH fish consumption advisory.

Watershed Code	Station ID			1				
VAW-N24R	9-LRY000	.28						
Collection Date Time	1	Do	I	BOD, 5	Nitrogen,	Hardness,	Fecal	E. Coli -
	Celsius	Probe	рH	DAY,mg/L	Ammonia, total	Total (mg/L as	Coliform, Membr	MTEC-MF
		mg/L	S.U.		(mg/L as N)	CACO3)	Filter,M-FC	N0/100ml
			1				BROTH,44.5 C	
08/01/1996 15:00	18.00	8.5	7,40			18.0	1200	
11/04/1996 14:30	9.00	8.2	8.50			18.0	<100	
02/03/1997 15:00	6.50	11.6	8.50			15.7	<100	
05/01/1997 15:00	24.40	8.7	8.60			21.1	<100	
11/03/1997 13:30	8.50	9.	7.90	<2.0	< 0.04	15.3	100	
02/09/1998 14:30	6.70	12.5	7.60	<2.0	< 0.04	25.8	<100	
05/21/1998 15:30	17.60	9.1	8.00	<2.0	< 0.04	25.6	400	
02/03/1999 15:00	7.70	11.1	7.80	3,000	< 0.04	16.0	<100	
05/03/1999 15:30	13.00	9.4	8.60	<2.0	<0.04	10.0	<100	
07/13/1999 15:00	15.90	8.6	8.70	2.000	.080	19.5	1800	
11/09/1999 15:00	11.10	9.3	7.90	<2.0	<0.04	14.7	<100	
01/11/2000 15:00	6.40	10.2	8.20	<2.0	<0.04	10.0	<100	
03/07/2000 15:00	11.20	9.7	7.80	<2.0	<0.04	21.0	<100	
05/03/2000 15:00	14.20	9.9	7.70	<2.0	<0.04	16.0	<100	
07/25/2000 09:00	15.30	9.5	7.79	<2.0	< 0.04	21.1	100	
09/26/2000 09:00	12.60	8.9	7.39	<2.0	< 0.04	9.2	500	
11/20/2000 08:30	1.20	13.4	8.48	<2.0	<0.04	5.0	<100	
01/30/2001 10:50	4.90	12.6	7.81	<2.0	<0.04	9.0	<100	
03/15/2001 09:10	5.70	11.91	8.51	<2.0	<0.04	10.7	<100	
08/14/2003 10:10	17.06	9.41	7.65		<0.04			200
10/29/2003 16:30	10.13	9.34	7.62		<0.04			<25
12/16/2003 09:30	6.41	10.18	6.08		<0.04			<25
02/12/2004 10:00	2.70	12.24	7.44		<0.04			25
04/27/2004 09:25	9,87	9.4	7.73		<0.04	!		<25
06/15/2004 09:00	16.70	8.8	7.42		< 0.04			75
10/26/2004 09:50	10.60	10.98	6.79		<0.04			<25
12/16/2004 09:55	1.03	13.47	7.93		<0.04			<25
02/15/2005 09:55	5.44		7.62		<0.04			<25
04/13/2005 09:50	8.40	11.03	7.58		<0.04			75
06/14/2005 09:30	16.50	9.6	7.50		<0.04			100

90th Percentile pH 8.52 S.U. 10th Percentile pH 7.40 S.U. 90th Percentile temp 17.1 °C Mean Hardness 15.9 mg/L

MEMORANDUM

DEPARTMENT OF ENVIRONMENTAL QUALITY

WEST CENTRAL REGIONAL OFFICE

3019 Peters Creek Road

Roanoke, VA 24019

SUBJECT: PC NO. 97-0610

____ INITIAL REPORT_X COMPLETION REPORT

WCRO POLLUTION COMPLAINT FILE

FROM: L. D. WILLIS, Ph.D.

DATE:

September 23, 1997

COPIES: JIM SMITH, JIM SCOTT

THE FOLLOWING TEXT IS TO DOCUMENT A VISUAL INSPECTION OF THE MT. LAKE BIOLOGICAL STATION STP, GILES CO., VA. THE INITIAL INVESTIGATION WAS CONDUCTED JANUARY, 1997, BY L. D. WILLIS AND A BENTHIC SURVEY WAS CONDUCTED BY JON ZALEWSKI AND CHARLENE WAYBRIGHT, DEQ, WCRO ON JULY 7, 1997.

THE JANUARY INSPECTION REVEALED A DISCHARGE COMING FROM THE STP PIPE DURING A PERIOD WHEN THE PLANT IS SUPPOSED TO BE SHUT DOWN. FURTHER INVESTIGATION INDICATED A SPRING WAS FLOWING AROUND AND INTO THE TREATMENT WORKS AND FLOWING OUT THE DISCHARGE PIPE. THIS IS A PRBLEM BECAUSE THE EFFLUENT IS BEING DILUTED BEFORE DISCHARGE AND THE SEWAGE CAN RUN OUT OF THE PLANT THE SAME WAY AND CONTAMINTED THE SOIL AROUND THE PLANT.

THE JANUARY STREAM SURVEY WAS CALLED OFF BECAUSE OF INDICATIONS THAT THE STREAM HAD RECENTLY FROZENWITH ANCHOR ICE WHICH COULD HAVE CAUSED IMPAIRMENT TO THE STREAM. ALSO, BECAUSE THE DISCHARGE WAS DETERMINED TO BE SPRING WATER THE SURVEY WAS NOT NEEDED AT THAT TIME. THE JULY SURVEY WAS DURING PEAK DISCHARGE FROM THE PLANT. (MY INTERPRETATION OF THE DATA IS THAT NO MEASUREABLE ENVIRONMENTAL IMPAIRMENT IS OBSERVED. THE DOMINANT TAXA IS CHLOROPERLIDAE STONEFLIES WHICH ARE VERY POLLUTION SENSITIVE. DIVERSITY IS LOW IN BOTH THE CONTROL AND TEST STATIONS WHICH IS EXPECTED IN SMALL, HEADWATER, MOUNTAIN STREAMS.

ACTION TAKEN OR STAFF RECOMMENDATIONS

I RECOMMEND THAT THE FACILITY DIVERT TTHE SPRING WATER FROM ENTERING THE TREATMENT WORKS.

ield Collection Data Sheet Sample Identification Oyrds downstreem River Mile: Location: Stream: 12:00 from plant Method: Time: Date: wash it Observer: Monitoring Station Information County: USGS Quad Map: Region: Longitude: WBS Segment: Latitude DCR Watershed: HUC: Eco-region: Sub eco-region: Land Use: Chemical & Physical Water Conditions 7.29 Water Temperature: : Hq Dissolved Oxygen: Residual Chlorine: Salinity: Conductivity: 13 Habitat Characteristics 11+5+17+5+19+16+5+16+10+15+ Average Depth (centimeters): Average Width (meters): Odor: Turbidity: Color: Taxa Collected: Hydroptilidae Lepidostomatidae Spongillidae Heptageniidae Fresh Water Sponges Leptophlebiidae Necephemeridae Oligonauriidae Laptocaridae Dendroccelidae Flacworms Limnophilidae Molannidae Odontoceridae Planariidae Polymitarcyidae Poramanthidae Ancylidae Limbers Siphionuridae Tricorythidae Philopocamidae Phryganidae Polycencropodidae Lymnaeidae_ Non Operculate Smail Physidae_____ Planorbidae Psycomylidae_ Rhyacopnilidae_ Sericoscomatida Calopterygidae Coenagrionidae Lestidae Odonata - Zygoptera Mydrobiidae Coerculate Spails Protoneuridae Pleuroceridae Lapidoptera Viviparidae Aesbnidae Corduligastridae Cordulildae Odonata - Anisoptara Colsoptera Chrysomelidae Unionida Corbiculidae Curculionidae Sphaeriidae Unionidae Dryopidae Comphidae Libellulidae Dytiscidae Slmidae_ Gyrinidae Lumbriculida Lumbriculidae Macromiidae Pecaluridae Haliplidae Enchytraeidae Tubificida Capniidae Chloroperlidae <u>#</u> Leuctridae Helodidae Hydrophilidae Placoptera Limmichidae Noceridae Psephenidae Nemouridae Haplotaxidae Jap.locaxida Peltoperlidae Perlidae Perlodidae Ptilodactylidae Erpodellidae Leaches Glossiphonidae Rirudinidae Piscicolidae Athericidae Pteronarcidae Diptera Taeniopcarygidae Blebnariceridae Canaceidae Ceratopogonidae Reloscomatidae Brachiobdellidae Hemiptexa Brachiobdellida Chaoboridae (A) Chironomidae (B) Corixidae Gelascocoridae Decopoda - Crayfish Cambaridae Gerridae Hebridae Kydrometridae Palaemonidae Culicidae Fresh Water Shrimp Dolichopodiame Asellidae Mesovellidae Leccoda Naucoridae Nepidae Notonectidae Empididae Ephydridae Grammaridae_ Amphipada Muscidae

Valiidae

Sisyridae

Corydalidae_ Sialidae

Brachycentridae

Calamoreriatidae Glossocomatidae Relicopsychidae Hydropsychidae

Paycodidae Ptychopteridae

Sciomyzidae Simulidae Stratiomylda Syrphidae Tabanidae

Tanyderidae Tipulidae

Talitridae

Lobertiidae

Regridae

Sperchomidae

Bactidae
Bactiscidae
Caenidae
Ephemerellidae
Bphemeridae

Arractideidae Diplodontidae Hydrachnidae

Meurotera

Magalosters

Tricoptera

Budracar ins

Epheseropters

'eld Collection Data Sheet

Sample Ident	ification		Cantrol			_
Stream: Date: 7/ Observer: 0	1197 Trumpight/Zale	Locat Time: u:S/4	ion: Trib. to Hund	er's Branch Ri Me	ver Mile: thod:	
Monitoring S	tation Informat	ion			 -	_
Region: Latitude HUC:		t: tude: egment:		County: USGS Quad Map DCR Watershed		
Eco-region: Sub eco-region Land Use:	n:					
Chemical & F	hysical Water C	Conditions				
Dissolved Oxy	gen: 192 pH	1:6.34	Water Tempera	ture: <u>19.0</u>		1
Conductivity:		linity:	Residual Chlo	orine:		
Habitat Char	acteristics 🛭	+5+14+	3+15+11+	-5+18+17	1+19+19+19	_
Average Width	(meters):		h (centimeters)			ì
Color:	,	Turbidity:		Odor	:	ĺ
Taxa Collect	Spongillidae	<u> </u>	Reptageniidae		Hydropcilidae	_
/lacworms	Dendrocoelidae		Leptophlebiidae Neoephemaridae Oligoneuriidae Polymicarcyidae		Lepidoscomacidae Leptoceridae Limmophilidae Molannidae	
Limpets Fon Opermulate Smail	Ancylidae Lymnaeidae Physidae Planorbidae	Odonata - Zygoptera	Pocamanthidae Siphlomuridae Tricorythidae		Odontoceridae Philopocamidae Phryganidae Polycentropodidae Paycomylidae	
Operculate Stails	Hydrobiidae Pleuroceridae Viviparidae		Leacidse	Lapidopcara	Rhyacophilidae Sericostomatidae Pyralidae	
Jnionida	Corbiculidae Sphaeriidae Unionidae	Odonsta - Anisoptera	Aeshnidae Corduligastridae Corduliidae Gompnidae Libellulidae	Coleoptera	Chrysomelidae Curculionidae Dryopidae Dytiscidae	
Lumbriculida	Lumbriculidae		Macromiidae Petaluridae		Elmidae Gyrinidae Haliplidae	
Pubificida	Enchytraeidae Naididae Tubificidae	Flecopters	Caphridae Chloroperlidae		Helodidae Hydrophilidae Limnichidae	
Saplocarida	Haploraxidae		Nemouridae Paltoperlidae		Noceridae Psephenidae	
Looches	Erpodellidae Glossiphonidae Hirudinidae Piscicolidae		Perlidae Perlodidae Pterdnarcidae Taeniopterygidae	Diptera	Athericidae + Blephariceridae Canaceldae	
Brachiobdellide	Brach:obdellidae	Emiptera	Beloscomatidae		Ceracopogonidae Chaoboridae	
Decopoda - Crayfish	Cambaridae		Gelastocoridas Gerridas		Chironomidae (A)	
Fresh Water Shrimp	Palaemonidae		Hydromacridae		Culicidae Dixidae	
Isopoda	Agollidae		Mesoveliidae Naucoridae		Dolichopodidae Empididae	
Amphipoda	Granmaridae		Nepidae Noconectidae Veliidae		Sphydridae Muscidae Psycodidae	
Bydracarina	Arractideidae	Heurotera	sisyridae		Ptychopteridae Sciomyzidae Simulidae	
	Hydrachnidae Lebertiidae Sperchouidae	Megalopters	Corydalidae Sialidae		Strationyldae Symphidae Tabanidae	
Ephemeroptera	Baetidae Baetiscidae Caenidae Rphemerallidae Ephemeridae	Tricoptera	Brachycentridae Calamoceriatidae Clossosomatidae Helicopsychidae Rydropsychidae		Tanyderidae Tipulidae	

ield Collection Data Sheet Sample Identification 14:00 cost of a tral River Mile: Location: Stream: Method: Time: Date: Observer: Monitoring Station Information County: Basin: Region: USGS Quad Map: Longitude: Latitude DCR Watershed: WBS Segment: HUC: Eco-region: Sub eco-region: Land Use: Chemical & Physical Water Conditions Water Temperature: 18 Dissolved Oxygen: 1.10 Residual Chlorine: Salinity: Conductivity: Habitat Characteristics 15+10-16+13+ 20+13+11+10+'0+8+26 Average Depth (centimeters): Average Width (meters): Odor: Turbidity: Color: Taxa Collected: Hydroptilidae Lepidoscomatidae Heptageniidae_____ Leptophlebiidae Spongillidae Presh Water Sponges Laproceridae Limnophilidae Dendrocoslidae_ Planariidae Necephameridae Oligonauriidae Flat worms Polymitarcyida Potamanthidae Molannidae Odontoceridae Ancylidae Limpora Philopocamidae Sinhlonuridae Tricorythidae Phryganidae Lumpaeidae Polycentropouldae Prycomyildae Rhyacophilidae Non Operculate Spail Physidae Planorbidae Calopterygidae Coenagrionidae Lestidae Proconcutidae Odonata - Zygoptera Sericoscomacidae Hydrobiidae_______Pleuroceridae Coerculate Spails Pyralidae Lecidonters Viviparidae Aeshnidae Odonata - Anisoptera Cordulidas Cordulidas Cordulidas Chrysomelidae Coleoptera Upionida Corbiculidae Curculionidae Sphaerlidae Dryopidae_ Dyciscidae_ Elmidae_ Gyrinidae_ Gomphidae Libellulidae Unionidae Lumbriculida Lumbriculidae Petaluridae Haliplidae Helodidae Enchytramidae_ Tubi ficida Capniidae Chloroparlidae Placoptera Naididae Tubificidae Sydrophilidae Limnichidae Noceridae Leuctridae Nemouridae Haplocaxidae Repictaxide Psephenidae Pelcoperlidae Perlidae Ptilodactylidae Erpodallidae Glossiphonidae Leaches Perlodidae Pteronarcida Athericidae Diptara Mirudinidae_ Piscicolidae Blephariceridae Canaceidae Taeniopterygidae Ceratopogonidae Chaoboridae Chironomidae (A) Beloscomatidas Brachiobdellida Brachiobdellidae Heminters Coraxidae Gelastocoridae Decopoda - Crayfish Cambaridae Chironomidae (8) Culicidae_ Fresh Mater Shripp Palaemonidae Hebridae Hydrometridae Mesoveliidae Dixidae Delichonodidae Asellidae Liopada Empididae_ Bobydridae Naucoridae Nepidae Notonectidae Veliidae Grammaridae Amphipoda Muscidae Muscidae Psycodidae Ptychopteridae Sciomyzidae Similidae Stratiomyidae Arractideidae Bydracarina Diplodontidae Hydrachnidae Mentoters

Corydalidae Sialidas

Brachycentridae

Calamoceriatidae Glossosomacidae Helicoogychidae Hydropsychidae

Syrphidae Tabanidae Tanyderidae Tipulidae

Magalopters

Tricoptera

Sparchonidae

Ephaneropters

Baetidae Baetistidae Caenidae Sphemerellidae Rohemeridae

Attachment F

Wasteload and Limit Calculations

- Mixing Zone Calculations (MIXER 2.1)
- Effluent Data
- Wasteload Allocation Spreadsheet
- Antidegradation Wasteload Allocation Spreadsheet
- STATS Program Results (Ammonia as N)

Mixing Zone Predictions for

Mountain Lake Biological Station

Effluent Flow = 0.009 MGD Stream 7Q10 = 0.11 MGD Stream 30Q10 = 0.14 MGD Stream 1Q10 = 0.09 MGD Stream slope = 0.058 ft/ft Stream width = 4.5 ft Bottom scale = 3Channel scale = 1

Mixing Zone Predictions @ 7Q10

Depth = .0732 ft Length = 167.18 ft Velocity = .5589 ft/sec Residence Time = .0035 days

Recommendation:

A complete mix assumption is appropriate for this situation and the entire 7Q10 may be used.

Mixing Zone Predictions @ 30Q10

Depth = .0838 ftLenath = 149.12 ftVelocity = .6104 ft/sec Residence Time = .0028 days

Recommendation:

A complete mix assumption is appropriate for this situation and the entire 30Q10 may be used.

Mixing Zone Predictions @ 1Q10

= .0655 ftDepth Length = 183.89 ft Velocity = .52 ft/sec

Residence Time = .0982 hours

Recommendation:

A complete mix assumption is appropriate for this situation and the entire 1Q10 may be used.

Mountain Lake Biological Station WWTP VA0075361

Effluent Temperature Data (°C)

Jul-07	Jun-07	Jul-06	Jul-06	Jun-06	Aug-05	Jul-05	Jun-05	Aug-04	July-04	Jun-04
17.9	16.6	19.5	17.9	18.1	20.9	21.7	19.1	21.2	20.4	16
17.6	16.3	22.3	19.9	18.7	20.7	21.8	19.2	21.0	19.9	16.1
17.6	17.5	22.0	19.7	15.2	21.3	20.2	19.9	21.1	20.2	16
17.8	18.3	22.7	20.2	15.8	21.8	19.8	19.1	23.0	20.4	16.6
18.9	18.8	21.9	20.5	16.2	21.3	20.3	18.4	21.2	20.7	18
20.1	17.9	21.8	18.9	17.1	20.9	21.1	18.0	18.3	21.0	18.4
20.4	18.4	20.0	17.7	16.8		21.4	17.3	17.8	21.2	18.6
20.6	18.5	18.9	18.0	17.1		21.0	19.2		20.9	17.9
20.8	18.5	19.9	19.5	17.2		19.9	19.4		20.5	17.9
21	16.4	20.1	19.6	19.2		19.8	19.1		20.6	18.6
21.4	17.6	20.9	19.3	20.8		19.5	18.9		20.8	20.9
19.6	17.3	21.9	19.9	21.6		20.2	19.1		20.9	19.8
18.7	17.8	22.1	20.1	22.1		22.6	19.8		20.5	20.4
18.3	20.3	22.3	20.2	20.1		22.4	19.8		20.2	19.6
18.8	20.5	23.1	20.9	20.2		21.6	19.1		20.3	18.4
19.8	19.9	23.6	22.4	22.2		21.1	18.9		18.6	18.5
21.8	19.1	22.8	20.1	22.9		20.8	17.1		19.0	18.7
20.4	19.0	23.5	21.1	22.9		20.9	16.9		20.9	19.2
20.4	18.9	23.8	21.4	22.2		21.0	16.8		18.8	18.4
19.6	19.2	24.1	21.0	22.3		21.3	17.1		21.3	19
19	20.0	24.2	22.0	21.7		21.5	16.7		20.6	18.7
18.5	20.6	23.4	21.5	21.2		21.9	17.0		20.8	19.2
18.1	20.5	22.8	21.0	20.2		21.3	18.9		20.0	17
17.2	20.6	21.3	19.7	20.7		20.8	18.7		22.5	18.9
16.8	19.8	21.5	20.0	20.3		21.2	19.3		22.7	19
18.2		21.6	20.1			21.5	19.7		20.9	
18.5		23.9	22.9			22.4	19.8		21.0	
18.9		23.5	21.9			22.1	19.9		21.8	
19.3		23.3	22.0		ŀ	22.0			21.5	
19.4		23.4	22.4			22.3	J		21.0	
20.5		24.6	22.6			22.1	_		21.1	

Mountain Lake Biological Station WWTP VA0075361

Effluent pH Data (S.U.)

Jul-07	Jun-07	Jul-06	Jun-06	Aug-05	Jul-05	Jun-05	Aug-04	Jul-04	Jun-04
8.03	7.95	7.51	7.22	7.84	7.63	7.57	7.32	7.55	7.56
7.84	7.45	7.56	7.26	7.58	7.51	7.06	7.69	7.49	7.94
7.27	7.68	7.67	7.24	8.12	7.02	7.38	7.28	7.61	7.41
7.53	7.61	7.64	7.53	7.31	6.85	7.29	7.57	7.67	7.35
7.60	7.61	7.41	7.09	7.55	7.36	7.16	7.61	7.71	7.72
7.71	7.50	7.62	7.56		7.33	7.31	7.29	7.76	7.79
7.56	7.59	7.50	7.38		7.37	7.51	7.11	7.18	7.91
7.43	7.51	7.81	7.14		7.29	7.33		7.81	7.48
7.63	7.34	7.29	7.77		7.62	7.42		7.73	7.73
7.57	7.20	7.39	7.75		7.42	7.29		7.61	7.86
7.79	7.95	7.80	7.28		7.75	7.36		7.53	7.35
7.23	7.48	7.62	7.51		7.89	7.24		7.58	7.41
7.41	7.49	7.59	7.93		8.12	7.44		7.61	7.58
7.33	7.69	7.56	7.84		7.37	7.56		7.75	7.71
7.75	7.47	7.51	7.94		7.31	7.33		7.82	7.81
7.31	7.81	7.65	7.46		7.37	7,26		7.92	7.8
7.42	7.96	7.69	7.38		7.56	7.26		7.73	7.61
7.33	7.61	7.64	7.53		7.97	7.15		7.87	7.68
7.21	7.38	7.61	7.61		7.51	7.66		7.65	7.73
7.54	7.54	7.57	7.42		7.35	7.61		7.79	7.8
7.39	7.32	7.47	7.14		7.28	6.91		7.94	7.61
7.25	7.08	7.49	7.17		7.77	6.97		7.68	7.74
7.38	7.21	7.91	7.64		7.59	7.12		7.57	7.81
7.29	7.39	7.64	7.20		7.38	7.19		7.51	7.85
7.23	7.73	7.41	7.36		7.56	7.14		7.72	7.61
7.31		7.83			7.61	7.29		7.53	
7.21		7.51			7.85	8.08		7.71	
7.06		7.38			7.99	7.61		7.58	
7.70		7.64						7.51	
7.76		7.67						7.53	
7.99		7.24						7.74	

90th Percentile pH 10th Percentile pH 7.84 S.U. 7.23 S.U.

12/17/2007 - 9:46 AM

FRESHWATER WATER QUALITY CRITERIA / WASTELOAD ALLOCATION ANALYSIS

Mountain Lake Biological Station WWTP Facility Name:

Permit No.: VA0075361

Hunter Creek, UT (intermittent section) Receiving Stream:

Version: OWP Guidance Memo 00-2011 (8/24/00)

Stream Information		Stream Flows		Mixing Information		Effluent Information	
Mean Hardness (as CaCO3) =	25 mg/L	†Q10 (Annual) =	0 MGD	Annual - 1Q10 Mix =	100 %	Mean Hardness (as CaCO3) ==	25 ma/L
90% Temperature (Annual) =	17.1 deg C	7Q10 (Annual) =	o MGD	- 7010 Mix =	100 %	90% Temp (Annual) =	22.3 dea C
90% Temperature (Wet season) =	17.1 deg C	30Q10 (Annual) =	0 MGD	- 30Q10 Mix =	160 %	90% Temp (Wet season) =	22.3 deg C
90% Maximum pH =	8.52 SU	1Q10 (Wet season) =	0 MGD	Wet Season - 1Q10 Mix =	100 %	90% Maximum pH =	7.84 SU
10% Maximum pH =	7.4 SU	30Q10 (Wet season)	0 MGD	- 30Q10 Mix =	100 %	10% Maximum pH ≈	7.23 SU
Tier Designation (1 or 2) =	-	3005 =	O MGD			Discharge Flow =	0.009 MGD
Public Water Supply (PWS) Y/N? ≃	£	Наттоліс Меал =	0 MGD			1	
Trout Present Y/N? ==	*	Annual Average =	MGD				
Early Life Stages Present Y/N? =	*						

Parameter	Background		Water Quality Critéria	ity Criteria		1	Wasteload Allocations	Allocations		₹	Antidegradation Baseline	n Baseline		Antic	Antidegradation Allocations	Allocations		2 	lost Limiting	Most Limiting Allocations	
(ug/l unless noted)	Conc.	Acute	Chronic	Chronic HH (PWS)	Ħ	Acute	Chronic HH (PWS)	H (PWS)	Ħ	Acute	Chronic HH (PWS)	H (PWS)	Ξ	Acute	Chronic HH (PWS)	(SWA)	Ŧ	Acute	Chronic	HH (PWS)	Ŧ
Acenapthene	۵	ı	ı	e C	2.7E+03	,	ı	na.	2.7E+03	ı	ı	ı	,	,		ı		,		ē	2.7E+03
Acrolein	0	1		БП	7.8E+02	ı	ı	E	7.8E+02	ı	ı	;		1		;	ı	:	1	2	7.8E+02
Acrylonitrile	o	1	ı	eu	6.6E+00	t	ı	8	6.6E+00	ı	ı	,	ı	ı		1	1	:	1	2	6,65+00
Atdrin ^c Ammonia-N (mol))	٥	3.05+00	ı	g	1.4E-03	3.0E+00	ı	8	1.45-03	1	1	1	ı	ı	ı	ŗ	1	3.0E+00		ŧ.	1.4E-03
(Yearly)	0	7.55E+00	1.83E+00	2	ı	7.5E+00	1.8E+00	æ	ı	ı	ı	,	ı	ı	ı	ı	1	7.6E+00	1.8E+00	2	,
(High Flow)	0	7.55E+00	1.835+00	2	:	7.5E+00	1.8E+00	PB	ı	;	1	ţ	1	i	ı	1	1	7.5E+00	1.8E+00	82	ı
Anthracene	D	I	I	па	1.1E+05	ı	1	햩	1.1E+05	ı	1	1	ı	ı	1	ı	ı	1	;	ĕ	1.1E+06
Antimony	0	ı	ı	:18 E	4.3E+03	ı	ı	128	4.3E+03	ŧ	1	i	ı	1	1	1	1	ı	;	F	4.3E+03
Arsenic	0	3.4E+02	1.5E+02	ē		3.4E+02	1.5E+02	ם	ı	ı	ŧ	;	t	1	1	1	1	3,4E+02	1.5E+02	æ	1
Bartum	0	1	ı	B 70	;	:	,	2	!	ı	ı	:	ı	ı	ı	,	ı	,	1	2	1
Benzene ^c	0	I	ı	o.	7:1E+02		1	2	7.1E+02	ı	1	;	ı	ı	,	ı	ı	:	1	ē	7.1E+02
Benzidine ^c	0	1	ı	Ē	5.4E-03	ı	t	na Bu	5.4E-03	ı	1	1		ı	ı	ı	;	1	,	8	6.4E-03
Benzo (a) anthracene ^c	0	ı	1	E	4.9E-01	ı	ı	e.	4.9E-01	1	1	1		ı	;	;		,	1	ē	4.9E-01
Benzo (b) fluoranthene ^c	0	I	ı	ē	4.9E-01	ì	ı	Ē	4.9E-01	ı	1	ı	1	1	1	i	1		1	Ē	4.9E-01
Benzo (k) fluoranthene ^C	C	ı	ı	na Pa	4.9E-01	ı	ı	Ē	4.9E-01	ı	t	1	,	ı	ı	ı	;		1	2	4.9E-01
Benzo (a) pyrene ^c	0	ı	ı	en en	4.9E-01	,	ı	ē	4.9E-01	ı	:	1	ı	ı	1	1	1		,	ž.	4.9E-01
Bis2-Chlomethyl Ether	0	1	;	2	1.4E+01	ı	1	8	1.45+01	1	1	ı	•	1	1	;	:	;	ı	ů.	1.4E+01
Bis2-Chloroisopropyl Ether	0	t	:	18	1.75+05	ı	1	Ba	1.7E+05	,	i	1	1	:	1	1	1	1	;	na a	1.7E+06
Bramoform, ^c	0	1	:	뺱	3.6E+03	ı	ı	ē	3.65+03	;	1	1	ı	:	1	1	;	,	;	EC.	3.6E+03
Butylbenzylphthalate	0	I	ŀ	ם	5.2E+03	ı	ı	g	5.2E+03	ı	ı	1	1		ŧ	;	1	ı		ğ	5.2E+03
Cadmium	0	8.26-01	3.8E-01	2	ı	8.2E-01	3.8E-01	ē	,	1	ı	1	ı	:	1	1	<u></u> 1	8.2E-01	3.BE-01	Ē	
Carbon Tetrachloride ^c	0	1	ı	22	4.4E+01	1	ı	na	4.4€+01	ı	ı	1	1	;	t	ı	1	ı	:	BC	4,4E+01
Chlordane °	0	2.4E+00	4.3E-03	E.C.	2.2E-02	2.4E+00	4.3E-03	2	2.2E-02	1	ı		1	1	ı	,	1	2.4E+00	4.3E-03	뿉	2.2E-02
Chloride	0	8.6E+05	2.3E+05	檀	1	8.6E+05	2.3E+05	Bu	;	1	1	,	,	ı	1	1	;	8.6E+05	2.3E+06	<u>6</u>	ı
TRC	0	1.95+01	1.1E+01	ē	t	1.9E+01	1.15+01	E	ı	t	:	,	_	1	:	1	_ - -	1.9E+01	1.1E+01	ē	
Chlorobenzene	•	;		程	2.1E+04	١	1	82	2.1E+04	:	:	1	•	1	1	;	-			ПД	2.1E+04

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Parameter	Background		Water Quality Criteria	ility Criteria			Wasteload Allocations	Bocations		¥	Antidegradation Baseline	1 Baseline		Anti	Antidegradation Allocations	Allocations		2	Most Limiting Alfocations	Allocations	
(ug/l unless noted)	Conc	Acule	Chronic	HH (PWS)	Ħ	Acute	Chronic HH	H (PWS)	Ī	Acute	Chronic HH (PWS)	4 (PWS)	₹	Acute	Chranic HH (PWS)	H (PWS)	壬	Acute	Chronic	HH (PWS)	₹
Chlorodibromomelhane ^c	0	1	:	80	3,4E+02	:	,	na	3.4E+02	1	ı	;	1	t		1	ı	ı	:	na	3.4E+02
Chloroform ^c	0	1	ı	g	2.9E+04	ı	ı	BU.	2,9E+04	ı	1	ı	ı	ı	ı	ı	1	1	ı	na en	2.9E+04
2-Chloronaphthalene	0	ı	1	ē	4.3E+03	;	1	na	4.3E+03	1	ı	:	1	1	ı	!	ı	1	1	2	4.3E+03
2-Chlorophenol	0	ı	!	8	4.0E+02	ŧ	ı	82	4.0E+02	1	1	1	ı	ı	ı	;	ı	ı	ı	Ę	4.0E+02
Chlorpyrifos	o	8.3E-02	4.1E-02	ള	,	8.3E-02	4.1E-02	22	ŀ	ı	ı	ı	;	1	1	1	t	8.3E-02	4.1E-02	2	ı
Chromium III	o	1.8E+02	2.4E+01	Ē	ı	1.8E+02	2.4E+01	ם	Ē	;	1		1	ı	1	;	,	1.8E+02	2.4E+01	50	1
Chromium VI	۵	1.6E+01	1.1E+01	g	ı	1.6E+01	1.15+01	E	,	1	ı	1	ı	ı	,	1	ı	1.6E+01	1.1E+01	2	1
Chromium, Total	0	1	1	ē	1	1	ı	E	ı	ı	ı			1	ı	ı	ŧ		1	2	ı
Chrysene ^c	0	ı	1	Ē	4.9E-01	ı	ı	5	4.9E-01	t	ı	,		ı	1	1	ı		1	E.	4.9E-01
Copper	0	3.6E+00	2.7E+00	8	ı	3,65,+00	2.7E+00	Ē	ı	ı	ı	ı	ı	:	,	ı	1	3.6E+00	2.7E+00	82	ı
Cyanide	0	2.2E+01	5.2E+00	<u>e</u>	2.2E+05	2.2E+01	5.2E+00	en	2.2E+05	1	1	1	1	1	1	:	-	2.ZE+01	5.2E+00	E	2.2E+05
2000	0	ı	ı	2	8.4E-03	ı	ı	8	8.4E-03	1	:	1	i	ı	ı	1	٠.	,	ŧ	2	8.4E-03
DDE ^c	c	:	:	ē	5.9E-03	ı	1	E	5.9E-03	1	1	ı	,	:		1		,	1	E	5.9E-03
DDT	٥	1.1E+00	1.05-03	na	5,9E-03	1.1E+00	1.0E-03	8	5.95-03	ı	1	1	1	ı	ı	,	:	1.1E+00	1.0E-03	ē	6.9E-03
Demeton	o		1.05-01	œ.	1	1	1.0E-01	<u> B</u>	ı	ı	1	١	;	:		4	1	,	1.0E-01	ŧ	i
Dibenz(a,h)anthracena ^c	0	ţ	ı	2	4.9E-01	ì	ı	ā	4.9E-01	1	1	1	1	:		,	ı	ı		Пā	4.9E-01
Dibutyf phthalate	0	1	1	Da	1.2E+04	ı	1	E	1.2E+04		1	1	ı	!	ı	ı	,	ı	;	ğ	1.2E+04
Dichloromethane (Methylene Chloride) ^C	c	1	1	Z.	1 SF+04		!	ē	1.6F±04	;	ı	;	;	1	I	I	ı	;		i	10000
1 2.Dichlorobenzene	· c	· ;		9 8	7 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1			<u> </u>	78.10	: 1				: :	ı :	ı		1	:	2 :	1.00.04
1,2-Diching dented la		!	ı	į (20.00	!	ı	<u> </u>		ı	ı	;		:	1	I	I	ı	:	2	1.75+04
. i. 3-Dichipropenzene	- -	ı	ı	2	2.05+03	:	;	2	2 05+03	ı	ı	:	ı		1	ı	ı	ı	;	死	2.6E+03
1,4-Dichlorabenzene	D	ı	I	8	2.8E+03	F	ı	8	2.6E+03	1	1	1	ı	I	1	1	1	1	ı	2	2.6E+03
3,3-Dichlorobenzidine	0	ı	ı	Ē	7.7E-01	ı	ļ	2	7.7E-01	ı	:		ı	I	ı	ı	ı	1	:	2	7.7E-01
Dichloropromethane	0	ı	ı	BC C	4.6E+02			8	4.6E+02	ı	ı	ı	ı	ı		1	ı	ı	1	Ē	4.6E+02
1,2-Dichloraethane	0	I	I	Da	9.9E+02	,	ı	e.	9.9E+02	1	1	ı	··· -	t		1	1	:	ı	2	9.9E+02
1,1-Dichtoroethylene	0	1	í	2	1.7E+04	ı	ı	EL	1.7E+04	t	ı	ı	,	I	!		<u> </u>	ŗ	ŧ	2	1.7E+04
1,2-trans-dichloroethylene	a	ı		ē	1.4E+05	1	ı	Б	1.4E+05	ı	!	t	,	1	1	ı			1	ē	1.4E+05
2.4-Dichkorophenol	0	I	I	ua	7.9E+02	E	ı	eu U	7.9E+02	1	1	ı	ı	ı	i		,	:	ı	•	7.9E+02
2,4-Dichigraphenoxy acetic acid (2,4-D)	0	ı	!	<u> </u>	ı	1	ı	EL	ı	ı	,	ı	•	1	1		1	,	1	8	,
1,2-Dichloropropane ^c	0	1	1	ē	3.9E+02	ı	1	BE 1	3.9E+02	ı	ı	ı	ı	ı				:	ı	2	3.95+42
1,3-Dichloropropane	0	t	t	80	1.7E+03	ı	ı	e C	1.7E+03	1	ı	ı	1	ı	ı	;	•	;	ı	2	1.7E+03
Dieldrin ^c	0	2.46-01	5.6E-02	82	1.4E-03	2.4E-01	5.6E-02	BE	1.4E-03	ı	ı	ı	ı	ı	ı		1	2.4E-01	5.6E-02	2	1.4E-03
Diethyl Phthalate	0	ı	:	па	1.2E+05	ı	ı	g	1.2E+05	1	:	ı	1	ı	ŀ	:	;		1	2	1.2E+05
Di-2-Ethylhexyl Phthalate C	0	ı	ı	Па	5.9E+01	1	1	2	5.9E+01	ı		ı	,	I	ı	ı		:	1	5	5.9E+01
2,4-Dimelhylphenol	0	ı	ı	<u>E</u>	2.35+03	1	ı	B O	2.3E+03	ı	;	ı	,	1	1	:	;		1	2	2.3E+03
Dimethyl Phihalate	0	t	ı	Bu	2.9E+06	ı	ı	ē	2.9E+06	;		1	!	I	1	1	,	;	1	ē	2.9E+06
Di-n-Butyl Phthalate	0	t	ì	eu	1.2E+D4	t	ŀ	80	1.2E+04	ı	:	1	1	ı	ı	ı	ŀ		1	<u>=</u>	1.2E+04
2,4 Dinitrophenol	0	ı	ı	<u>6</u>	146+04	1	ı	E	1.4E+04	ı	1	1	:	ı		,	ŧ	:	1	5	1.4E+04
2-Methyl-4,6-Dinitrophenol	0	ı	I	EC	7.65E+02	1	ı	na	7.7E+02	ı	1	ı	;	ı			;	!	ı	2	7.7E+02
2,4-Dinifrataluene ^E Dioxin (2,3,7,8-	0	i	I	13	9.1E+01	ı	I	ē	9.1E+01	t	f	ı	ı		:	1	1	:	ı	2	9.1E+01
tetrachlorodibenzo-p-dioxin)																					
(bdd)	o	:	;	ec	1,25-06	ı	ı	8	뙫	1	1	1	1	ı	ı	ı	:	:	1	#	2
1,2-Diphenythydrazine	o	:	ı	ם	5.4E+00		t	<u>e</u>	5.4E+00		:	1	,	1	ı	ı	1		•	8	5.4E+00
Alpha-Endosulfan	0	2.2E-01	5.6E-02	ВП	2.4E+02	2.2E-01	5.6E-02	g.	2.4E+02	1	1	1	1	ı	ı	ı	ı	2.2E-01	5,6E-02	E	2.4E+02
Beta-Endosulfan	0	2.2E-01	5.6E-02		2.4E+02	2.2E-01	5.6E-02	22	2.4E+02	ı	ı	1	1	1	ı	ı	ı	2,2E-01	5.6E-02	2	2.4E+02
Endosulfan Sulfate	0	ı	ı	<u> </u>	2.4E+02		ı	묜	2.4E+02	1	t	:	1	4	ı	1	1	1	,	2	2.4E+02
Endrin	0	8.6E-02	3.6E-02	2	8,1 E -01	8.6E-02	3.6E-02	E	B.1E-01	ı	;	ı	•	1	ı	ı	1	8.6E-02	3,6E-02	2	8.1E-01
Endrin Aldehyde	0	1	ı	82	8.1E-01	ı		E	8.15-01	ı	ı	1	<u>ا</u>	t		1	1		1	2	8.1E-04

Parameter	Background	-	Water Cuality Criteria	ily Critoria			Macterial A Bootstoom	Pondione			National Control	100	-								
find an analysis		400	Chemic Cuality (Cham)	Tolare I	3	A coults	Charles Autoback	TOTAL ST	7 1		Angegregation baseine		+		Antidegradation Alocations	Mocations	+	_	ost Limiting	Most Limiting Allocations	
Edhulbonagan			200	Herry III	10.70	ethoc		_		•	(ewa) nn Janona		E	9	Curonic HH (PWS)	(FWS)		Acute	Chronic	HH (PWS)	₹
auezilecitua	3	ı	ı	g	7.91+04	ı	ŧ	ē	2.9E+04	t	:	ı	E				ı	:	1	2	2,9E+04
Finoranthene	<u>.</u>	ı	ı	ē	3,7E+02	ı	ı	80	3,75+02	:		1	,		1	1	,	ŧ	1	Ę	3.7E+02
Fluorene	o	I	i	ē	1.45+04	ı	ı	2	1.4E+04	ı		1		1		1	ı	;		Ē	1.4E+04
Foaming Agents	0	ı	•	ğ	ı	ŀ	1	na	ı		J	1		1	t	1	ı	;	,	2	
Guthion	a	:	1.0E-02	2	ş	ı	1.0E-02	an	1	ł	ł	,	1	ı	1	ı	,	;	1.0E-02	2	
Heptachlor ^c	0	5.2E-01	3.8E-03	Πa	2.1E-03	5.2E-01	3.8E-03	8	2.1E-03	,	ı	,	1	ı	t	1	1	5	3.8E.03	. a	2 15.03
Reptachlor Epoxide ^c	0	5.2E-01	3.8E-03	e).	1.1E-03	5.2E-01	3.8E-03	ē	1.1E-03	1	1	ı	1	1	ı	1			3.8F.03		4 1E 02
Hexachlorobenzene	0	I	ı	8	7.75-03	;		2	7 7E-03	ı	ı	ı		ı					6.0	Z :	2 1
Havachlorohidadiene				! !				! ;		I	I		 	ŧ	1	ı	:	ı		2	7.7E-03
Hexachiorocyclobexana	.	1	ı	e C	5.0E+02	1	ı	2	5.0E+02	ı	ŧ	ı	-	ı		ı	,	ţ	ı	ğ.	5.0E+02
Alpha-BHC ^c	٥	1	1	ē	1.3E-01	1	ı	800	1.3E-01	ı	f	ı	1	ı				1	1	ŧ	
Hexachlorocyclohexane																	1	I	ŀ	Ī	10-11-11-11-11-11-11-11-11-11-11-11-11-1
	0	:	;	펻	4.6E-01	1	ı	19	4.6E-01	ı	1		1	ι	1	1	ţ	1		2	4.6E-01
Hexachlorocyclohexane Gamma-BHC ^c (Lindane)	o	9.5E-01	E.	B.	6.3E-01	9.5E-01	ı	EG.	6.3E-01	ı	1	ı	ı	1	1	ı	1	9.5E-01	ŧ		6.3E-01
Hexachiorocyclopentadiene	0	,	;	ē	1.7E+04	:	1	ē	1.7E+04	1	ı	ı	_							į	-
Hexachloroethane	o	,	ı	ď	10+H2 8	ı	ı		104	ı	1		-		ı	!		ŧ	ì	<u> </u>	1./ 5404
Hydronen Sutfide		:	007906	! :			50.00	·		·	ı	ı		1	t	:			1	ē	8,9E+01
Indone (4 o a coll manne)		1	2.05100	Ē		1	Z.UE+00	80	1	1		1	ı	:	1	;			2.0E+00	ž	:
maero (1.2,3-co) pyrene	.		:		4.9E-01	ı	ı	B	4.9E-01	1	ı	,	-	ł	1	ı	ı	ı	:	29	4.9E-01
ligh.	0	:	1	ם	f	ı	1	텯	1	1	ı		1	ı	1	1	t	1	;	æ	,
Isophorone	0	ı	ı	ē	2.5E+04	ı	ı	., ez	2.6E+04	ı	1	1	ı	1	1	,	1	1	;	<u> </u>	2.6E+04
Kepone	0	1	0.0E+00	g	ı	1	0.0E+00	na Bu	:	1	ı			ı	1	ı	1	:	0.0E+00	2	,
Lead	0	2.0€+01	2.36+00	8	ı	2.0€+01	2.3E+00	na	:	1	ı	1	:	1	,	ı		2.0E+01 2	2.3E+00	2	-
Malathion	0	:	1.05-01	na	ı	ı	1.0 E -01	E	ı	1	1	1	_	1	;	1	-		1.0E-01	Ę	;
Manganese	a	1	1	8	1	ı	ı	80	1	1		1		,	ı		ì	t	1	20	,
Мегсилу	¢	1.4€+00	7.7E-01	2	5.1E-02	1.4E+00	7.7E-01	eu eu	5.1E-02	1	ı	,			ı	ı	1	1.4E+00	7.7E-01	Ē	5.1E-02
Methyl Bromide	Ó	ŧ	ı	ВП	4.0E+03	ı	:	na 4	4.0€+03		1	1	_	1	1	1	ı		,	e e	4.0E+03
Methoxychlor	0	F	3.0E-02		ı	ŗ	3.0E-02	몯	ı	,	ı	ı	_	ı	ŧ	1	1	1	3.0E-02	2	ı
Mirex	D	1	0.0E+00	B C	,	;	0.0E+00	e c	;	1	ı	,		ì	ı	1	1	,	0.0E+00	2	1
Monochlorobenzene	0	:	1	Б	2:1E+04	:	:	na 2	2.1E+04	ı	ı	ı	- 1	ı	:	1	1	;	ı	2	2.1E+04
Nickel	0	5.6E+01	6.3E+00	B	4.6E+03	5.6E+01	6.3E+00	në 4	4.6E+03	ı	,	ı		1	1	ı	1	6.8E+01 6	6.3E+D0	Ē	4.6E+03
Nitrate (as N)	0	1	I	БП	,	;	ı	85	;	ı	t	ı		ı	1	1	ı	:	ı	ž	:
Nitrobenzene	0	ı	:	13	1.9E+03	ı	1	na 1	1.9E+03		1	ı	_	1	ţ	1	1	:	{	ē	1.9E+03
N-Nitrosodimethylamine	0	ı	ı	8	8.15+01	ı	t	na B	8.1E+01		,	ı	;		1	1	1	:		Ē	8.1E+01
N-Nitrosodiphenylamine	0	1	ı	8	1.6E+02	1	ı	eu T	1.6E+02	1	,	1		ı	1	1	ı	1		ē	1.8E+02
N-Nitrosodi-n-propylamine	Đ	ı	ı	na	1.45+01	i	ı	E	1.45+01	1	1			ı		1	ı	1		ā	1.4E+01
Parathion	0	6,5E-02	1.3E-02	E		6.5E-02	1.3E-02	2	t	,	1	1	_	1	1		- 9	6.5E-02 1	1.3E-02	2	1
PCB-1016	0	1	1.4E-02	60	ı	ı	1.4E-02	2	1	1	ı	:		ı	,	1	ı	†	1.4E-02	2	
PCB-1221	0	,	1.46-02	ē	1		1.4E-02	E	1	ı	1	ı		1	1	ı	1	,	1.4E-02	2	1
PCB-1232	ů	ı	1.4E-02	e	'	1	1.4E-02	82	,	ı	ŧ			1	,	1	1	;	1.4E-02	2	
PCB-1242	o	1	1 4E-02	na	ı	ı	1.4E-02	na	,	1	,	,	,	1	t	1	· -	,	1,4E-02	2	-
PCB-1248	0	;	1.4E-02	탮	ı	1	1.4E-02	60	ı		1	ı		i	1	:	1	;	1.4E-02	E	-
PCB-1254	٥	,	1.4E-02	雹	ı	ι	1.4E-02	13	1	1	1		1		1	ı	,	,	1.4E-02	82	;
PCB-1260	0	1	1.4E-02	5	ı	1	1.4E-02	멸	1	1	ı		J	!	ı	1	1	1	1.4E-02	ra et	,
PCB Total [©]	0	, ,	ı	82	1.7E-03	١		na 1	1.7E-03	,	1		_	1	1	,	1	:	1	5	1.7E-03
]

Parameter	Background		Water Quality Criteria	ity Criteria			Wasteload Allocations	Allocations		An	tidegradatic	Antidegradation Baseline	-	Antic	legradation	Antidegradation Allocations		-	lost Limiting	Most Limiting Allocations	
(ng/) unless noted)	Corte.	Acute	Chronic	Chronic HH (PWS)	Ŧ	Acute	Chronic	HH (PWS)	Ŧ	Acute	Chronic H	HH (PWS)	Ŧ	Acute	Chranic H	HH (PWS)	Ŧ	Acute	Chronic	HH (PWS)	₹
Pentachlorophenol ^c	0	1.1E+01	8.4E+00	BU	8.2E+01	1.1E+01	8.4E+00	na L	8.2E+01	1	1		1	;		 	,	┨	1	ם	8.2E+01
Phenol	0	ı	ı	BC	4.6E+06	:	1	2	4.6E+06	ı	ı	ŀ	ı	1	ı	ı	ı	1	1	5	4.6€+D6
Pyrene	0	,	ı	ā	1.1E+04	1	ı	2	1.1E+04	1	1	ı	,	,	ı	ı	ı	1	,	ē	1.15+04
Radionuclides (pCi/l except Beta/Photon)	0	ı	1	80	;	1	1	2	ı	ı	,	1	ı	ı	:	ı	1	:	ı	7	t
Gross Alpha Activity	0	,	1	8	1.5E+01	ı	1	2	1.5E+01	ı	1	I	1	ı	,	ì	ı	:	1	2	1.5E+01
(mrem/yr)	o	1	ı	29	4.0E+00	ı	ı	er	4.0E+00	ı	ı	ı	1	1	ı	ı		;	1	92	4.0É+0d
Strontium-90	6	ı	ı	eu	8.0E+00	t	ı	. 2	8.0E+00	1	1	ı	,	ı	:	ŀ	,	;	ı	na en	8.0E+00
Tatium	0	ı	ı	na	2.0E+04	ı	ı	82	2.0E+04	ı	ı	ı	,	ı	1	;	1	:	ţ	2	2.0E+04
Selenium	0	2.0€+01	5.0E+00	28	1.1E+04	2.0E+01	5.0E+00	ē	1.1E+04	1	1	1	,	ı	;	,	1	2.0E+01	5.0E+00	ä	1.1E+04
Silver	o	3.2E-01	ı	2	ŀ	3.2E-01		ē	,	1	ı	ı		1	1	1	;	3.2E-01	1	E	
Sulfate	0	ŧ	ı	2	1	ı	t	2	ı	:	1	1	1	ı	:	1	1	ı		Ē	
1,1,2,2-Tetrachioroethane	0	ı	,	S.	1.1 E +02	1	1	2	1.15+02	ŗ	ı	1	ı	ı	1	ı	1	ı		ec ec	1.1E+02
Tetrachioroethylene ^c	0	1	t	ec.	8,9E+01	:	1	22	8.9E+01	1	ı	ı	,	ı	ı	1	ı	1		eu	8.9E+01
Thallium	0	'	ı	B	6.3E+00	1	ı	2	6.3E+00	ı	ı	:	ı	ı	t	t	1	ı	,	па	6.3E+00
Toluene	ь	1	ı	е Е	2.0E+05	,	ı	<u> </u>	2.0E+05	ţ	1	:	1	ı	ı	t	1	ŧ	ı	Па	2.0E+05
Total dissolved solids	6	'	1	8	1	:	1	Ē	ı	ı	ı	:	1	ı	1	ı	ı	,	t	2	1
Toxaphene ^c	0	7.3E-01	2.05-04	80	7.5E-03	7.3E-01	2.0E-04	B	7.5E-03	ı	,	1		1	ı	1	ı	7.3E-01	2.0E-04	2	7.5E-03
Tributyllin	6	4.6E-01	6.3E-02	ē	1	4.6E-01	6.3E-02	9	ı	1	1	1	!	ı		;		4.6E-01	6.3E-02	ē	-
1.2.4-Trichlarobenzene	o	ı		eu eu	9.4E+02	1	ı	5	9.4E+02	ı	ı	1	ı	ı	;		,	:	1	E	9.4E+02
1.1,2-Trichloroethane ^c	a	ı		gu	4.2E+02	1	1	e	4.2E+02	1	Ł	1	,	1	ı	ı	1	:	1	ņ	4.2E+02
Trichloroethylene ^c	0	ı	ı	na	8.1E+02	ı	1	en en	8.1E+02	;	ı	ı	ı	:	,	ı	ı	;	·	E	8.1E+02
2,4,6-Trichlaropheral ^c	o		ì	80	6.5E+01	ı	ı	9	6.5E+01		,	,	ı	1	ı	ı	1	t	:	2	6.5E+01
2-(2,4,5-Trichlorophenoxy) propionic acid (Silvex)	0	1	1	g	1	I	1	22	ı		,	1	1	ı	,	1	ı	ı	,	Ę	ŀ
Vinyl Chloride ^c	0	,	1	2	6.1E+01	ı	ı	2	6.1E+01	,	ι	•	ı	ı	ı	,	1	ŧ	:	e C	6.1E+01
Zinc	O	3,6E+01	3.6E+01	e.	6.9E+04	3.66+01 3.66+01	3.6E+01	na	6.9E+04	1	1		1	1	ı	1	ı	3.6E+01	3.6E+04	2	6.9E+04

- 1. All concentrations expressed as micrograms/liter (ug/l), unless noted otherwise
- 2. Discharge flow is highest monthly average or Form 2C maximum for Industries and design flow for Municipals
- Metais measured as Dissolved, unless specified otherwise
- 5. Regular WLAs are mass balances (minus background concentration) using the % of stream flow entered above under Mixing Information.
- 4. "C" indicates a carcinogenic parameter
- Antidegradation WLAs are based upon a complete mix.
- 6 Antideg. Baseline = (0.25(WQC background conc.) + background conc.) for acute and chronic = (0.1(WQC - background conc.) + background conc.) for human health
- 7 WLAs established at the following stream flows: 1010 for Acute, 30010 for Chronic Ammonia, 7010 for Other Chronic, 3005 for Non-carcinogens, Harmonic Mean for Carcimogens, and Annual Average for Dioxin. Mixing ratios may be substituted for stream flows where appropriate.

Antimony	4.3E+03	minimum QL's provided in agency
Arsenic	9.0E+01	guidance
Banum	БП	
Cadmium	2.3E-01	
Chromium III	1.4E+01	
Chromium VI	6.4月+00	
Copper	1.5E+00	
ro.	E LI	
Pead	1.4E+00	
Manganese	na	
Mercury	5,15-02	
Nickel	3.8E+00	
Selenium	3.0E+00	
Silver	1.3E-01	
Zinc	1.4E+01	

Target Value (SSTV) Note: do not use QL's lower than the

Metal

12/17/2007 - 9:45 AM

FRESHWATER WATER QUALITY CRITERIA / WASTELOAD ALLOCATION ANALYSIS

Mountain Lake Biological Station WWTP Facility Name:

Permit No.: VA0075361

Pond Drain (perennial section) Receiving Stream:

Version: OWP Guidance Memo 00-2011 (8/24/00)

Stream Information		Stream Flows		Mixing Information		Effluent Information	
Mean Hardness (as CaCO3) =	25 mg/L	1Q10 (Annual) =	0.09 MGD	Annual - 1Q10 Mix =	100 %	Mean Hardness (as CaCO3) =	25 mg/L
90% Temperature (Annual) =	17.1 deg C	7Q10 (Annual) =	0.11 MGD	- 7010 Mix =	400 %	90% Temp (Annual) ≖	22.3 deg C
90% Temperature (Wet season) =	17.1 deg C	30Q10 (Annual) =	0.14 MGD	- 30Q10 Mix =	400 %	90% Temp (Wet season) =	22.3 deg C
90% Maximum pH =	8.52 SU	1Q10 (Wet season) ≈	0.15 MGD	Wet Season - 1Q10 Mix =	400	90% Maximum pH =	7.84 SU
10% Maximum pH ≈	7.4 SU	30Q10 (Wet season)	0.31 MGD	- 30Q10 Mix=	100 %	10% Maximum pH =	7.23 SU
Tier Designation († or 2) ≈	2	3005 =	0.16 MGD			Discharge Flow =	0.009 MGD
Public Water Supply (PWS) Y/N? =	c	Harmonic Mean ≖	0.5 MGD				
Trout Present Y/N? =	>	Annual Average ≈	MGD				
Early Life Stages Present Y/N? ≂	>-						

Core Acade Core Acade Core High-Wes High-	Parameter	Background		Water Qua	Water Quality Criteria			Wastekad Allocations	Allocations		∢.	Antidegradation Baseline	n Baseline		Ant	Antidegradation Allocations	Allocations		2	lost Limitin	Most Limiting Allocations	
1 1 1 1 1 1 1 1 1 1	(ug/l unless noted)	Cornc.	Acute	Chronic	HH (PWS)	£	Acute	Chronic	IH (PWS)	Ŧ	Acute		H (PWS)	Ŧ	Acute	Chronic	H (PWS)	壬	Acute	Chronic	HH (PWS)	₹
1	Acertapthene	0	I	ı	ПВ	2.7E+03	ı		80	5.1E+04	1	1	Ba	2.7E+02	1	1		5.1E+03		ŧ	ra L	5.1E+03
1	Acrolein	0	ı	1	πa	7.8E+02	1	+	2	1.5E+04	;	ı	80	7.8E+01	ı	ţ		1.5E+03	ı	;	ē	1.5E+03
1 1 1 1 1 1 1 1 1 1	Acrylonitrile ^c		ı	ı	2	6.8E+00	ï	ı	ā	3.7E+02	ı	ı	ng	6.6E-01	i	1		1.7E+01	1	ı	ē	3,7E+01
Colorectivity Colorectivit	Aldrin ^c	c	3.0€+00	ı	ē	1.4E-03	3.3E+01	ì	na	7.9E-02	7.5E-01	1	2	1.4E-04	8.3E+00	ı			3.3E+00	1	ē	7.9E-03
Fighth F	(Yearly) Ammonia-N (mgl)	۵	2.64E+00	1.02E+00	22	ı	2.9E+01	1.7E÷01	8	ı	6.59E-01	2.54E-01	2	ı	7.2E+00	4.2E+00	B		.2E+00	4.2E+00	5	
1	(High Flow)	٥	2.42E+00	9.52E-01	a	ı	4.3€+01	3.45+01	<u> </u>	1	6.05E-01	2.38E-01	па	,	1.16+01	8.4E+00	ne		1.1E+01	8.4E+00	ë	:
nony in contraction of contraction o	Anthracene	o	ı		et et	1.16+05	1	ı	2	2.1E+06	:		100	1.1E+04	1	ı		1.1E+05	;		na	2.1E+05
Handing Landing Land	Antimony	o	•	;	g	4,3€+03	ı	ı	2	8.1E+04		,		4.3E+02	ı	t		1.1E+03	ı	,	P.	8.1E+03
inthe fine fine fine fine fine fine fine fin	Arsenic	٥	3.4E+02	1.5E+02	80	ı	3.7E+03	2.0E+03	82	1	8.5E+01	3.8E+01	80	,	9.4E+02	5.0E+02	멸		1.4E+02	6.0E+02	2	:
Figure Color Col	Barium	Ð	1	ı	2	I	I	ı	ē	1	1	ı	ec.	ı	,	1	2	ı	,	:	Ē	;
indifferent consistency of a state of a stat	Benzene ^c	o	ı	ı	2	7.1E+02	i	1	ם	4.0E+04	,	ı	120	7.1E+01	;	ı		:0E+03	t	;	2	4.0E+03
(a) fluctuation schools of the continuous	Benzidine ^c	٥	ı	ı	eg C	5.4E-03	1	ı	ם	3.1E-01	ı	ı		6.4E-04	1	1		3.1E-02	1		2	3.1E-02
(o) (b) fluoranthene (c) (b) fluoranthene (c) (c) (b) fluoranthene (c) (d) fluoranthene (d) fluoranthene (d) (d)	Benzo (a) anthracene ^c	0	ŧ	,	e.	4.9E-01	ı	,	藍	2.8E+01	ı	ı	2	4.9E-02	1	1		.8E+00	1	1	2	2.8E+00
(a) By years (b) By constitutions (c) By years (c) B	Benzo (b) fluoranthene ^c	D	1	I	B E	4.9E-01	ı	ı	멸	2.8E+01	:	1	en	4.9E-02	ı	ı		.8€+00	t	1	ā	2.8E+00
Collocypering © 0 -	æ	0	ı	ı	я	4.9E-01		,	2	2.8E+01	ı	ı	a	4.9E-02	,	1			1	1	2	2.8€+00
Chlorocetryl Ether 0 — and 1.4E+01 a. and 1.4E+01 a	Benzo (a) pyrene ^c	0	ı	ı	EL	4.9E-01	ı	ı	2	2.8E+01	ı	1	na	4.9E-02	ı	ı		.8E+00	i	ı	ā	2,8E+00
Chlorosopropyl Ether 0 -	Bis2-Chloroethyl Ether	5	1	1	na	1.4E+01	ı	1	뭗	2.6E+02	ı	1	E.C.	1.4E+00	ı	ı		:6E+01	1	ı	ē	2.6€+01
voform \$\infty\$ 0 - - na 3.6E+03 - - na 2.0E+04 - na 3.6E+03 - - na 2.0E+04 - na 3.6E+02 - na 3.6E+02 - na 3.6E+02 - na 3.6E+03 - na 9.6E+03 - na 9.6E+03 - na 9.6E+03 - na 9.6E+03 na - na 9.6E+03 - na 9.6E+03 na - na 9.6E+03 na - na 9.6E+03 na - na 9.6E+03 na na 2.6E+03 na na 2.6E+03 na na 2.6E+03 na	Bis2-Chloroisopropy) Ether	0	ı	ı	ë	1.7E+05	1	ı	2	3.2E+06	ı	ı	29	1 7E+04	;	1		2E+05	•	1	ē	3.2E+06
benzyphthelate 0 8.2E-01 3.8E-01 na 5.2E+03 - na 9.8E+04 - na 5.2E+02 - na 9.8E+03 - na 9.8E+04 - na 9.8E+03 na - na 9.8E+04 - na 9.8E+03 na - na 2.8E+03 na na na 2.8E+03<	Bromoform ^c		1	ı	g	3.6E+03	ı	ı	8	2.0E+05	1	ı		3.6E+02	ı			10E+04	ı	ı	ē	2.0E+D4
nium 0 8.2E-01 3.8E-01 na 4.4E+01 na 2.5E+03 na 2.5E+03 na 3.2E-03 6.0E+00 na 2.5E+03 na 2.5E+03 na 2.2E-03 6.0E+00 na 2.5E+03 na 2.2E-03 na 2.	Butylbenzylphthalate	o	1	ı	g	5.2E+03	ŧ	1	па	9.8E+04	ı	1		5.2E+02	ı	1		:8E+03	:	ı	e	9.8E+03
on Tetrachloidide 6 0	Cadmium	٥	8.2E-01	3.85-01	8	1	9.05+00	5.0E+00	ē	ı	2.1E-01	9.5E-02	22	:	2.3€+00	1.3E+00	na	-	3E+00	1.3E+00	2	ı
dane c 0 2 4 E+00 4.3 E-03 na 2.2 E-02 2.6 E+01 5.7 E-02 na 1.2 E+00 6.0 E-01 1.1 E-03 na 2.2 E-03 6.6 E+00 1.4 E-02 na 1.2 E-01 6.6 E+00 1.4 E-03 na 1.2 E-01 1.4 E-03 na 1.2 E-01 1.4 E-03 na	Carbon Tetrachioride ^c	Þ	ı	1	2	4.4E+01	ł	ļ	80	2.5E+03	1		E	£.4E+00	ı	;		.5E+02	1	ı	2	2.5E+02
ide 0 8.6E+05 2.3E+05 na - 9.5E+06 na - 2.2E+05 5.8E+04 na - 2.4E+08 7.6E+05 na - 2.4E+08 7.6E+05 na - 2.4E+08 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Chlordane ^c	٥	2.4E+00	4.3E-03	E	2.2E-02	2.6E+01	5.7E-02	na	1.2E+00	6.0E-01	1.1E-03	8	2.2E-03	6.6E+00	1.4E-02		_		1.4E-02	Ę	1.2E-01
0 1.9E+01 11E+01 na – 2.1E+02 1.5E+02 na – 4.8E+00 2.8E+00 na – 5.2E+01 3.6E+01 na – 5.2E+01 na	Chloride	ö	8.6E+05	2.3E+05	2	ı	9.5E+06	3.0E+08	ē	ı	2.2E+05	5.8E+04	E	ı	2.4E+08	7.6E+05	22		.4E+06	7.6E+05	ē	,
0 = - no 2 (E+0.4 no 3 0E+0.6	TRC	0	1.9€+01	1 15+01	E L	ı	2.1E+02	1.5E+02	85		4.8E+00	2.8E+00	8	1	5.2E+01	3.6E+01	6			3.6E+01	2	ı
18 2.15-04 118 2.15-05 - 118 2.15-05 - 118	Chkyobenzene	0	ı	ı	na	2.1E+04	,	,	2	3.9E+05	1	-	. au	2.1E+03	1	1	na 3	3.9E+04	1	:	2	3.8E+04

Parameter	Background		Water Quality Critena	ity Critena			Wasteload Al	Bocations		Ar	Antidegradation Baseline) Baseline		Ant	Antidegradation Allocations	Allocations		•	Most Limiting Allocations	Allocations	
(ug/l unless noted)	Conc.	Acute	Chranic	HH (PWS)	Ŧ	Acute	Chronic HH (PWS)	H (PWS)	Ŧ	Acule	Chronic HH (PWS)	1 (PWS)	Ŧ	Acute	Chronic H	HH (PWS)	₹	Acute	Chronic H	HH (PWS)	Ŧ
Chlorodibromomethane ^c	0	-	,	8	3.4E+02	:	,	E.	1.9E+04	-		an an	3.4E+01	ļ,	:	E	1.9E+03	1	4	2	1.9E+03
Chloraform ^c	0	'	,	죑	2.9E+04	1	1	<u> </u>	1.6E+06	ı	ı	99	2.9E+03	ı	:	Ē	1.6E+05	ı	;	.	1.6E+06
2-Chloronaphthalene	0	ı	,	B	4.3E+03	;	ı	<u> </u>	8.1E+04	1	ı	na ,	4.3E+02	ı	1	<u> </u>	8.1E+03	:	,	몬	8.1E+03
2-Chlorophenal	0	ı	ı	Bu	4.0E+02	:	ı		7.5E+03	ı	1	, En	4.0€+01	ı		6	7.5E+02	;	;	2	7.5E+02
Chlorpyrifos	o	8.3E-02	4.1E-02	па	ı	9.1E-01	5.4E-01	Па	,	2.1E-02	1.0E-02	e.	1	2.3E-01	1.4E-01	g	ı	2.3E-01	1.4E-01	2	i
Chromium III	0	1.8E+02	2.4E+01	E E	1		3.1E+02	BU		4.6E+01	6.0E+00	멷	1	5.0E+02	7.9E+01	<u>e</u>	1	5.0E+02	7.9E+01	2	1
Chromium VI	1	1 6E+01	1.16+01	6	1	1.8E+02	1.5E+02	82	t	4.0E+00	2.8E+00	2	1	4.4E+01	3.6E+01	B	;	4.4E+01	3.6E+01	2	ı
Chromium, Total	0	ı	ı	9	,	ı	ı	E	1	ı	1	BE		1	1	Ē	ı	:	ı	2	:
Chrysene c	Ö	1	ı	Ba	4.9E-01	ı	ı	9	2.8E+01	ı	;	22	4.9E-02	1	1	9	2.8E+00	·	1	ž	2.8E+00
Copper	0	3.6E+00	2.7E+00	힏	t	4:0E+01	3.65+01	85	,	9.1E-01	6.8E-01	<u> </u>	ı	1.0E+01	9.1E+00	8	1	1.0E+01	9.1E+00	2	;
Cyanide	0	2.2E+01	5.2E+00	ē	2.2E+05	2.4E+02	6.95+01	g	4.0E+06	5.5E+00	1.3E+00	E .	2.2E+04	6.1E+01	1.7E+01	E E	4.0E+05		1.7E+01	na	4.0E+05
مەمە د	a	٠		g	8.4E-03	ı	1	E	4.86-01		ı	e L	8.4E-04		:	ë			1	Ē	4.8E-02
ope °	o	·	t	па	5.9E-03	ı	1	82	3.3 E -01	;	ı	- Ja	5.9E-04		1	ğ	3.3E-02	:	,	Ĕ	3.3E-02
DOT ^c	0	1.1E+00	1.0E-03	ם	5.9E-03	1.2E+01	1.3E-02	8	3.3E-01	2.8E-01	2.5E-04	, E	5.9E-04	3.0E+00	3.3E-03	80	3.3E-02	3.0E+00	3.3E-03	2	3.3E-02
Demeton	0	ı	1.0E-01	2	ı	ı	1.3E+00	18	ı	;	2.5E-02	ē	ı	1	3.3E-01	e.	,	1	3.3E-01	ē	ı
Dibenz(a,h)anthracene c	0	ı	ı	B L	4.9E-01	ı		ē	2.8E+01	1	1	ā	4.9E-02	,	1	2	2.BE+00	ı		Ē	2,8É+00
Dibutyl phthalate	0	ı	ı	6	1.2E+04	ı	ı	2	2.3E+05	ı	ı	Г	1.2E+03	ı	I	e.	2.3Ё+04	1	:	ec	2.3E+04
Uncharromemaris (Methylene Chloride) ^c	٥	1	ı	ЕП	1.6E+04	1	ı	8	9.0E+05	ı	ı	₽.	1.6E+03	ı	t	8 2	9.0E+04	ı	:	e	9.dE+04
1,2-Dichtarobenzene	0	1	1	<u>E</u>	1.7E+04	1	ı	E	3.2E+05	1	1	na	1.75+03	1	ı		3.2E+04	1	,	2	3.2E+04
1,3-Dichlorobenzene	0	ı	ı	na	2.6E+03	t	ı	ē	4.9E+04	1	1	, Eu	2.6E+02	ı	ı		4.9E+03	,	,	2	4.9E+03
1,4-Dichlorobenzene	0	ı	ı	ē	2.6E+03	ı	ì	80	4.9E+04	1	1	2	2.6E+02	ı	:	8	4.9E+03	;	:	9	4 96+63
3,3-Dichlorobenzidine ^c	0	ı	ı	D3	7.7E-01	ı	ı	8	4.4E+01	,	,	2	7.7E-02	ı	ı	ē	4.4E+00	;	ı	! 2	4.4E+00
Dichiorobromomethane ^c	0	ı	1	E C	4,6E+02	ı	ı	g	2.6E+04	t	ı	e u	4.6E+01	1	1	100	2.8E+03	:	1		2.8E+03
1,2-Dichloroethane ^c	٥	r	ı	92	9.9E+02	ı	ı	E	5.6E+04	•	,	na S	9.9E+01	ı	1	92	5.6E+03	ì	ŧ	펻	6.6E+03
1.1-Dichloroethylene	0	ı	ı	잗	1.7E+04	ı	ı	2	3.2E+05		,	138 1	1.7E+03	1	1	ä	3.2E+04	;	ł	Ĕ	3.2E+04
1,2-trans-dichlomethylene	0	ı		S.	1.4E+05	1	1	8	2.6E+06	1	1	en 1	1.4E+04	ı	1	2	2.6E+05	·	;	E	2.5E+05
2,4-Dichlorophenol	0	;	,	8	7.9E+02	1	ı	na	1.5E+04	1	1	na 7	7.9E+01	:	1	쿋	1.5E+03	,		2	1.5E+03
2.4-Dichlorophenoxy	o		1	2	1	ı	ı	ğ	ı	:	ı	g	ı		,	Ē	-	1	1	ē	
aceuc acia (z,4-t/)	, ,	•	,	2 2	3 96+03	1	,	2 8	2.2E404		ı		105404				20726		:	! ;	: 0710
1.3-Dichloropropene		•		2 2	1 7F+03	ı		} &	371108	,			1 75+07	. !	: 1		20115 201103	: :		9 2	2.25.103
Dieldzin ^c	0	2.4E-01	5.6E-02	2	1.4E-03	2.6E+00	7.4E-01	! 2		Ş	1.4E-02		1.4E-04	6.6E-01	1.9E-01			6.6E-01	1.96-04	. 2	7.9E-03
Diethyl Phthalate	0	:		92	1.2E+05	1	,	2	2.3€+06	1	ı	na 1	1.2E+04		i	2	2,3E+05	1	1	2	2.3E+05
Di-2-Ethylhexyl Phthalate ^c	o	ı	ı	82	5.9E+01	ı	1	90	3.3E+03	;	ı	82	5.9E+00	;	1	2	3.3E+02	;		8	3.3E+02
2,4-Dimethylphenol	0	:	ı	핃	2.3E+03	1	,	E	4.35+04	;	1	na 2	2.3E+02	;	ı	2	4,3E+03	1	1	2	4.3E+03
Dimethyl Phthalate	0	ı	,	6	2.9E+06	,		2	5.4E+07	1	1	EII Z	2.9E+05	ı	1	80	5.4E+08	1	:	2	5.4E+06
Di-n-Butyl Phthalate	0	ı	ı	B L	1.2E+04	Ē	ŀ	8	2.3E+05	ı	1	81	1.2E+03	í	ı	Ē	2.3E+04	;		2	2.3E+04
2,4 Dinitrophenol	0	ı	ı	<u> </u>	1.4E+04	ı	ı	2	2.6E+05	ı	ı	na 1	1.4E+03	ı	,	<u>E</u>	2.6E+04	ı	:	eu.	2.6E+04
2-Methyl-4,6-Dinitraphenal	0	1	1	E	7 65E+02	:	,	œ.	1,4E+04	ı	ı	na 7	7.7E+01	ı	1	BL	1.4E+03	1	;	2	1.4E+03
2,4-Dinitrotoluene	o	1	ı	8	9.1E+01		,	<u>2</u>	5.1E+03	1	1	na S	9.1E+00	I	ı	na Eu	5.1E+02	1		2	5.1E+02
tetrachloradibanzo-p-dioxin)	ı				!												!				
(bdd)	0	i	1	<u> </u>	1.2E-06	1	1	E	ē	ı	ı	E	1.2E-07	ı	ı	ec.	1.2E-07	1	1	2	Ë
1,2-Diphenylhydrazine	0	ı	ı	2	5.4E+00		ı	2			ı	8			ı	<u> </u>			t	2	3.1€+01
Aipha-Endosulfan	a	2.2E-01	5.6E-02	2	2.4E+02		7.4E-01	na			1.4E-02	14 12			1.9E-01	8			1,9E-01	2	4.5E+02
Beta-Endosulfan	0	2.2E-01	5.6E-02	80	2.4€+02	2.4E+00	7.4E-01	E		5.5E-02	1,4E-02	2	2.4E+01	6.1E-01	1.9E-01	na Eu		6.1E-01	1.96-01	£	4.5E+02
Endosulfan Sulfate	Ö	1	1	펻	2.4E+02		1	na			ı	na 2	2.4E+01		1	na ,	4.5E+02		1	a u	4.5E+02
Endrin	D 1	8.66-02	3.6€-02	霆	8.15-0-	9.56-01	4.86-01	80		2.2E-02	9.0E-03		8.1E-02	2.4E-01	1.2E-01			2.4E-01	1.2E-01	na na	1.6E+00
Endin Aldehyde	0	;	ţ	<u> </u>	8.15-01	ı	:	뢷	1.5€+01			P	8.1E-02	:		E	1.55+00	1	+	2	1.6E+00

Demonster	Daniel and		0				1						-				ŀ				
	packground		water Quanty Criteria	rity Collectia		Г	Wasteload Al	llocations	1	- 1	Antidegradation Baseline	Baseline	+		Antidegradation Allocations	Allocations	+	1		Allocations	
(ug/l unless noted)	Conc	Acule	Chronic	TH (PWS)	Ŧ	Acute	Chronic HH (PWS)	H (PWS)	₹	Acute	Chronic HH (PWS)	(PWS)	_ ≣	Acute	Chronic HH (PWS)	+ (PWS)	Ŧ	Acute	Chronic #	HH (PWS)	Ŧ
Ethylbenzene	O	;	ı	2	2.9E+04	ı	ı	E	5.4E+05	t		na 2.	2.9E+03	ı		na 5	5.4E+04	:	,	2	5.4E+04
Fluoranthene	0	1		60	3.7E+02	ı	ı	45	6.9E+03	ı	ı	na 3.	3.7E+01	1	,	Па	6.9E+02	:	t	2	6.9€+02
Fluorene	0	,	1	na	1.4E+04	ţ	ı	BE	2.6E+05	1	,	ы. Т	1.4E+03	1	1	na 2	2.6E+04	1	,	2	2.6E+04
Foaming Agents	0	t		en en	1	ı	1	8	1	ı	ı	8 C	,	ı	t	80	;		1	별	:
Guthion	c	,	1.0E-02	20	ı	ı	1.36-01	8	ı	ı	2.5E-03	<u> </u>	1	1	3,3€-02	핕		1	3.3E-02	ā	:
Heptachlor ^c	a	5.2E-01	3.85-03	ĸ	2:1E-03	5.7E+00	5.0E-02	ē	1.2E-01	1.3E-01	9.5E-04	na 2	2.1E-04	1.4E+00 1	1.3E-02	na 1	1.2E-02	1,4E+00	1.3E-02	113	1.2E-D2
Heptachlor Epoxide ^c	0	5.2E-01	3.8E-03	na	1.1E-03	5.7E+00	5.0E-02	6	6.2E-02	1.35-01	9.5E-04	er T			1.35-02	9			1.3E-02	2	6.2E.03
Hexachlorobenzene ^G	a	:	1	eu	7.7E-03	1	1	B	4.4E-01	1	ı	na 7			1	62			:	! E	4.4F.07
Hexachlorobutadiene	0	ı	t	2	5.0E+02	1	ı	E	2.8E+04	1	ı		5 OF +04	ı	ı		2 85+03		. ;		200700
Hexachlorocyclohexane								!									3	ı	:		Z.0E+U3
Ajona-BHC	0	1	I	2	1.35.01		1	2	7.4E+00	ı	1	na 1.	1.3E-02	ı	ı	na 7	7.4E-01	ı	;	82	7.4E-01
Hexachiorocyconexana Beta-BHC ^C	0	1	ı	2	4.6E-01	ı	1	2	2.6E+01	ı	:	5	4.8E-02	ı	I	60	2 6F+00	ŀ	ı	4	2 8 11 100
Hexachlorocyclohexane	•				į													l	ı	•	-
Gamma-BHC" (Undane)	0	9.5E-01	e e	2	6.3E-01	1.0E+01	1	ē	3.6E+01	2.4E-01	:	na G	6.3E-02 2	2.6E+00	;	na 3	3.6E+00 2	2.6E+00	ı	ą.	3.6E+00
Hexachiorocyclopentadiene	0		ı	뾷	1.7E+04	1	:	5	3.2E+05	:	,	na 1.	1.7E+03		ı	na 3	3.2E+04	1	,	g).	3.2E+04
Hexachlomethane ^c	0		1	<u> </u>	8.9E+01	ı	:	빧	5.0E+03	t	ı	na 8.	8.9E+00	į	1	na S	5.0E+02	1	:	ē	5.0E+02
Hydrogen Sulfide	0	i	2.0E+00	æ	1	;	2.6E+01	na a	1	1	5.0E-01	e C	1	1	6.6E+00	13	ı	1	6.6E+00	2	1
Indeno (1,2,3-cd) pyrene ^c	0	1	t	8	4.96-01	1	ı	2	2.8E+01	1	ı	na 4	4.9E-02	1	1	na 2.	2.8€+00	ı		2	2.8E+00
hon	0	ı	ı	Ba	,		ı	B	ı	ļ	,	gt.	1	ı	1	na	ı	;	ı	50	ı
isophorone ^c	o	1	1	2	2.6E+04	I	,	8	1.5E+06	ı	t	na 2.	2.6E+03	1	ı	TB 1	1.5E+05	:	1	2	1.5E+05
Kepone	0	1	0.0E+00	8	ı	ı	0.0E+00	80	,	1	0.0E+00	B.	,	1	0.0E+00	ā	1	:	0.0E+00	6 E	;
Lead	0	2.0E+01	2.3E+00	8	1	2.2E+02	3.1E+01	80	<u>''</u>	5.1E+00	5.8E-01		٠c	5.6E+01 7.	7.6E+00	8	l I	5.8E+01 7	7.6E+00	80	,
Malethion	o		1.0E-01	펻	1	1	1.3E+00	8	1	1	2.5E-02	82	:	۱	3.3E-01	ng G	1	1	3,36.01	2	,
Manganese	o		i	2	1	ı	,	g.	ı	ı	ı	æ	1	1	t	2	1	ı	;	50	:
Mercury	5	1.4E+00	7.7E-01	na	5.1E-02	1.5E+01	1.0E+01	ng Pu	9.6E-01	3,5E-01	1.9E-01	na 5.	5.15-03 3	3.9E+00 2.	2.5E+00	Ra 9	9.6E-02 3.	3.9E+00 2	2.6E+00	æ	9.6E-02
Methyl Bromide	0	ı	1	2	4.0E+03	1	1	pia.	7.5E+04	1	1	na 4.6	4.0E+02	1	1	na 7.	7,5E+03	1	,	2	7.6E+03
Methoxychior	0	,	3.0E-02	na na	ı	÷	4.0E-01	<u> </u>	ı	1	7.5E-03	25	1	l L	9.9E-02	E.	1	1	9.9E-02	2	1
Mirex	0	ı	0.0E+D0	E .	1	1	0.0E+00	ē	1	1	0.0E+00	85	1	1	0.0E+00	na Pa	1		0.0E+00	2	1
Monachiorobenzane	5	ı	1	e.	2.15+04	:	ı	ng.	3.9E+05	ı		na 2.	2.1E+03	t	:	na 3.	3.8E+04	,	ı	2	3.9€+84
Nickel		5.6E+01	6.3E+00	па	4.6E+03	6.2E+02	8.3E+01	e L	8.6E+04	1.4E+01 1	1.6E+00	1.4 1.4	4.6E+02 1	1.6E+02 2.	2.1E+01	na 6	8.5E+03 1,	1,6E+02 2	2.1E+01	2	8.6E+03
Nitrate (as N)	0	ı	ı	na	1	1	ı	ם	;	1	1	22	1	1	1	2			ı	na en	1
Nitrobenzene		ı	1	8	1.95+03	ı	1	13	3.6E+04	ı	1	na	1.9E+02	t	:	na 3.	3.6E+03		1	5	3.6E+03
N-Nitrosodimethylamine ^c		ı	ı	B L	8.1E+D1	ı	ı	<u> </u>	4.6€±03	ı		. 83	8.1 E +00	ı	:	na 4	4.6E+02			81	4.6E+02
N-Nitrosodiphenylamine ^c	0	ı	;	펄	1.6E+02	ı	1	ā	9.0E+03	ļ	ı	na 1.1	1.6E+01	ı	t	na 9.	9.0E+02			g	9.0E+02
N-Nitrosodi-n-propylamine ^c	0	1	ı	ē	1.4E+01	ı	ı	eu eu	7.9E+02	1	1	na 1.2	1.4E+00		1	na 7.	7.9E+01	,	;	ē	7.9E+01
Parathion	ь	6.5E-02	1.3E-02	ם	:	7.2E-01	1.7E-01	8	1	1.6E-02	3.3E-03	ā	-	1.8E-01 4	4.3E-02	22	;	1.8E-01 4	4.3E-02	E	;
PCB-1016	6	ı	1.4E-02	13	ı	ı	1.9E-01	ē	ı	1	3.5E-03	5	,		4.6E-02	핃	1	1	4.6E.02	2	1
PCB-1221	0	ı	1:4E-02	ec.			1.95-01	22	1	;	3,5E-03	e E	1	1	4.6E-02	a ⊓	ı	1	4.6E-02	2	ı
PCB-1232	0	1	1.4E-02	밀	;	:	1.9E-01	2	ı	1	3.5E-03	80	ı	1	4.6E-02	n'a	1	1	4.6E-02	2	ı
PCB-1242	0	1	1.4E-02	2	1	1	1.9E-01	2	ı	1	3.5E-03	13	1	1	4.6E-02		ı	;	4.6E-02	2	1
PCB-1248	0	t	1.4E-02	5	1	1	1.9E-01	틷	ı	1	3.5E-03	22		1	4.6E-02	8	:	:	4.6E-02	2	ı
PCB-1254	0	1	1.4E-02	<u> </u>	1	ı	1.9E-01	Ē	1	1	3.5E-03	22		1	4.6E-02	Ba		;	4.6E-02	5	
PCB-1260	D	ı	1.4E-02	œ.	;	ı	1.9E-01	ā	1	1	3.5E-03	6		1	4.6E-02	8	-	:	4.6E-02	na	
PCB Total ^c	D	<u>'</u>		B E	1.7E-03	,	,	Пa	9.6E-02	1	,	- F	1.7E-04	ı	ı	Pa 8	9.6E-03			80	9.6E-03

Parameter	Background		Water C	Water Quality Criteria			Wasteload	Wasteload Allocations		*	Antidegradation Baseline	on Baseline		Ari	Antidegradation Allocations	Allocations		2	Wost Limitin	Most Limiting Affocations	
(ug/l unless noted)	Conc.	Acute	Chronik	Chronic HH (PWS)	HH (Acute	Chronic HH (PWS)	HH (PWS)	Ŧ	Acute	Chronic	HH (PWS)	Ŧ	Acute.	Chronic HH (PWS)	IH (PWS)	王	Acute	Chronic	нн (РWS)	Ŧ
Pentachlorophenol ^c	0	1.3€+01	9.8E+00	or na	8.25+01	1.4E+02	1.3E+02	BU	4.6E+03	3.2E+00	2.5E+00	100	8.2E+00	3.5E+01	3.3E+01	na na	4.6E+02	3.6E+01	3.3E+01	пя	4.6E+02
Phenol	Þ	1	1	æ	4.6E+06	1	1	ē	8.6E+07	i	ı	E .	4.6E+05	ı	ı	2	8.6E+08	:		ğ	8.6E+06
Pyrene	0	٠	ı	92	1.15+04	ı	ı	8	2.1E+05		,	g	1.1E+03	;	ı	ē	2.1E+04			2	2.1E+04
Radionuclides (pCi/l except Beta/Photon)	0	ı	•	ē	f	ı	1	2	ı	ı	ı	Ē	ı	ı	;	na	ì	ì	ı	ā	,
Gross Alpha Activity	ь	ı	ı	별	1,5E+01	I	ı	eu	2.8E+02	I	ı	2	1.5E+00	ı	ı	an	2.8E+01	:	1	Ę	2.8E+01
Beta and Photon Activity (mrem/yr)	c	!	ı	na	4.0E+00	ı	ı	2	7.5E+01	!	;	e.	4.0E-01	1	1	ē	7.5E+00	:	1	Ą	7.5E+00
Strontium-90	o	١	1	ā	8.0E+00	ı	ı	8	1.5E+02	:	ı	85	8.0E-01	i	ı	Ē	1.5E+01	1	,	2	1.5E+01
Tritium	0	:	t	ם	2.05+04	t	ı	ē	3.8E+05	1	;	ē	2.0E+03	ŧ	1	EU.	3.8E+04		1	ВÜ	3.8E+04
Selenium	0	2.0E+01	5.0E+00	00 Tra	1.16+04	2.2E+02	8.6E+01	멸	2.1E+05	5.0E+00	1.3E+00	8	1.1E+03	5.55+01	1,75+01	B	2.1E+04	5.5E+01	1.7E+01	ф	2.1E+04
Silver	0	3.2E-01	ı	8 2	:	3.5E+00	:	g	1	7.96-02	ı	8 0	ı	8.7E-01	ı	2	ı	8.7E-01		E	t
Sulfate	0	t	ţ	na	:	F	:	na	1	;		ē	1	1	1	5	1	ı		ē	1
1,1,2,2-Tetrachloroethane	0	1	1	EE.	1.1 E +02	:	,	22	6.2E+03	1	ı	<u>E</u>	1.1E+01	ı	ı	8	6.2E+02	1	,	E.	6.2E+02
Tefrachloroethylene ^c	c	1	1	æ	8.9E+01	:	1	P	5.0E+03	1	1	ri E	8.9E+00	ı	ı	82	5.0E+02	1	1		5.0E+02
Thallum	0	ı	ı	5	6.3E+00	;	ı	B E	1.2E+02	ı	ı	멸	8.3E-01		1	80	1,2€+01	t	1	2	1.2E+01
Toluene	0	1	ı		2.0E+05	;	ı	2	3.8E+06	ı	ı	8	2.0E+04	ı	ı	82	3,8E+05	ı	ι	2	3.8E+06
Total dissolved solids	0	ı	1	82	ı	:	;	5		ı	1	ag C	1	1	ı	e.	1	ı	,	2	1
Тохарнеле с	0	7.3E-01	2.0E-04	4 08	7.5E-03	8.0E+00	2.6E-03	2	4.2E-01	1.8E-01	5.0E-05	ē	7.5E-04	2.0E+00	6.6E-04	ē	4.2E-02	2.0E+00	6.6E-04	Ē	4.2E-02
Tributy/liln	0	4.6E-01	6.3E-02	2 na	ı	5.1E+00	8.3E-01	2	1	1.2E-01	1.6E-02	2	1	1.3E+00	2.1E-01	8	;	1.3E+00	2.1E-01	2	ı
1,2,4-Trichlorobenzene	0	1	1	Ē	9,4E+02	:	,	ē	1.8E+04	1	1	E C	9.4E+01	1	1	ē	1.8E+03	:	1	2	1.8E+03
1,1,2-Trichloroethane ^c	0	ı	ı	ē	4.2E+02	ı	ł	E.	2.4E+04	1		2	4.2E+01	1	ı	60.	2 4E+03	:	ı	2	2.4E+03
Trichloroethylene ^c	0	ı	:	BU	8.1E+02	1	ı	ec.	4.6E+04	t	ı	na	8.1E+01	1	;	ē	4.6E+03		ı	2	4,6E+03
2,4,6-Trichlorophenol ^C	0	1	ŧ	e	6.5E+01	1	1	8	3.7E+03	ı	,	ē	8.5E+00	1		82	3.7E+02	ţ	ı	8	3.7E+02
2-(2,4,5-Trichlorophenoxy) propionic acid (Silvex)	a	ı	:	na	ı	ı	t	£0	ı	ı	,	e e	1	1	1	50	ı	,	1	na	;
Vinyl Chloride ⁵	0	1	1	ē	6.1E+01	ı	ı	F13	3.4E+03	ı	1	E	6.1E+00	ı	;	na na	3.4E+02	1	1	2	3.4E+02
Zinc	0	3.6E+01	3.6E+01	Tage	6.95+04	4.0E+02 4.8E+02	4.8E+02	E	1.3E+06	9.1E+00	9.1E+00	E	6.9E+03	1.0E+02	1.2E+02	18	1.3E+05	1.0E+02	1.2E+02	Ē	1.3E+05

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- 1. All concentrations expressed as micrograms/liter (ug/l), unless noted otherwise
- 2. Discharge flow is highest monthly average or Form 2C maximum for Industries and design flow for Municipals
- 3. Metals measured as Dissolved, unless specified otherwise
 - 4. "C" indicates a carcinogenic perameter
- 5. Regular WLAs are mass bakences (minus background concentration) using the % of stream flow entered above under Moing Information.
- 6. Antideg. Baseline = (0.25(WQC background conc.) + background conc.) for acute and chronic

Antidegradation WLAs are based upon a complete mix.

- = (0.1(WOC background conc.) + background conc.) for human health
- 7 WLAs established at the following stream flows: 10.10 for Acute, 300.10 for Chronic Ammonia, 70.10 for Other Chronic, 300.5 for Non-carcinogens,
 - Hamonic Mean for Carcinogens, and Annual Average for Dioxin. Mixing ratios may be substituted for steam flows where appropriate.

Metal	Target Value (SSTV)	Note: do not use QL's lower than the
Antimony	8,1E+03	minimum QL's provided in agency
Arsenic	3.0E+02	guidance
Barium	- La	
Cadmium	7.6E-01	
Chromium III	4.7E+01	
Chromium VI	1.8E+01	
Copper	4.0E+00	
lron	eu eu	
Lead	4.6E+00	
Manganese	BC	
Mercury	9.6E-02	
Nickel	1.2E+01	
Selenium	9.9E+00	
Silver	3.5E-01	
Zinc	4.0E+01	

x.exe"	Ammonia - Dry Season - Chronic	8.392 90th Percentile Temp. (dea C) 17.414	90th Percentile pH (SU)		MAX 17.414	(7.688 - pH)	3.947 (pH-7.688) 0.743		2.636 Early LS Present Criterion (mg N 1.016	Ž	Early Life Stages Present?	Effective Criterion (mg N/L) 1.016		American Mat Canada		8.436 90th Percentile Temp. (deg C) 17.247	-1.232 90th Percentile pH (SU) 8.476		MAX 17.247	(7.688 - pH)	3.624 (pH - 7.688) 0.788			Early LS Absent Criterion (mg N) 0.952	Effective Criterion (mg N/L) 0.952	
MGD DISCHARGE FLOW - STREAM MIX PER "Mix.exe"	Ammonia - Dry Season - Acute	90th Percentile pH (SU) 8					Trout Absent Criterion (mg N/L 3		Effective Criterion (mg N/L) 2					America West Connection	Alliffichita - Met Season - Acute	90th Percentile pH (SU) 8	(7.204 - pH)				interion (mg N/L		Effective Criterion (mg N/L) 2			
0.009 MGD DISCHARG	Discharge Flow Used for WOS-WLA Calculations (MGE 0 009		Stream Flows Total Mix Flows	Allocated to Mix (MGD) Stream + Discharge (MGD)	Dry Season Wet Season Dry Season Wet Season	0.090 0.150 0.099	0.110 N/A 0.119	0.140 0.310 0.149	N/A 0.169	N/A 0.509	Annual Avg. 0.000 N/A 0.009 N/A		Stream/Discharge Mix Values	Dry Season Wet Season		(deg C) 17.414	1Q10 90th% pH Mix (SU) 8.392 8.436	30Q10 90th% pH Mix (SU) 8.431 8.476	7.381	7Q10 10th% pH Mix (SU) 7.385 N/A		Calculated Form	1010 Hardness (mg/L as CaCO3) 25.0 25.0			

Discharge Flow Used for WQS-WLA Calculations (MGC 0.009 0.009 0.000				0.008	MGD DISCHAR	0.009 MGD DISCHARGE FLOW - COMPLETE STREAM MIX	AM MIX		
100% Stream Flows Total Mix Flows Albocated to Mix (MG2D) Stream + Discharge (MGD) C1204 - pH C1204 C1308 C1309 C1509 C150	Discharge Flo	w Used for WOS-W	VLA Calc	uiations (MGE		Ammonia - Dry Season - Acu	ute	Ammonia - Dry Season - Chronic	nic
Albeated to Mix (MGD) Albe						90th Percentile pH (SU)	8.392	90th Percentile Temp. (dea C)	17.414
Allocated to Mix (MGE) Stream + Discharge (MGE) Cot		100% Stream F	Flows	Total №	fix Flows	(7.204 - pH)	-1.188	90th Percentile pH (SU)	8,431
Dry Season Wet Season Wet Season Wet Season Wet Season Wet Season O.150 O.150 O.150 O.150 O.150 O.150 O.150 O.150 O.149 O.140		Allocated to Mix.	GG MGD MGD	Stream + Dis	charge (MGD)	(pH - 7.204)	1.188	NIM	2.365
0.090		Dry Season Wet	Season	Dry Season	Wet Season			MAX	17.414
0.110 N/A 0.119 N/A Trout Absent Criterion (mg N/L 3.947 (p Trout Present?	1010	0.090	0.150	0.099	0.159	Trout Present Criterion (mg N/I	2.636	(7.688 - pH)	-0.743
0.140 0.310 0.149 0.319 Trout Present? V	7010		A/A	0.119	ΑN	Trout Absent Criterion (mg N/L	3.947	(pH - 7.688)	0.743
0.160 N/A 0.169 N/A Effective Criterion (mg N/L) 2.636 Ei	30Q10		310	0.149	0.319	Trout Present?	>		
0.500	3005		ΚN	0.169	N/A	Effective Criterion (mg N/L)	2.636	Early LS Present Criterion (mg N	1.016
Stream/Discharge Mix Values Stream/Discharge Mix Values Stream/Discharge Mix Values Stream/Discharge Mix Values Dry Season Wet Season Wet Season Wet Season Wet Season Wet Season Wet Season Met Season	Harm, Mean		ΚX	0.509	√/Z			Early LS Absent Criterion (mg N/	1.016
Stream/Discharge Mix Values 5 Temp. Mix (deg C) 17.573 17.394 % Temp. Mix (deg C) 17.414 17.247 % Temp. Mix (deg C) 17.414 17.247 % Det Mix (SU) 5 pH Mix (SU) 6 pH Mix (SU) 7.381 MA Trout Present Criterion (mg N/L 3.624 Trout Present Cr	Annual Avg.		٧X	0.00	√Z Z			Early Life Stages Present?	>
charge Mix Values Ammonia - Wet Season - Acute Ammonia - Wet Season - Acute 90 17.573 17.394 90th Percentile pH (SU) 8.436 90 17.414 17.247 90th Percentile pH (SU) 8.436 90 8.431 8.436 (7.204 - pH) -1.232 M 7.381 N/A Trout Present Criterion (mg N/L 2.421 (7 7.385 N/A Trout Absent Criterion (mg N/L 3.624 (ph 7.386 N/A Trout Present? Y Y 7.387 N/A Trout Present? Y Y 7.387 N/A Trout Present? Y Y 8.5000 25.000 25.000 25.000 25.000 25.000 Effective Criterion (mg N/L) 2.421 E8								Effective Criterion (mg N/L)	1.016
Dry Season Wet Season		Stream/Disc	charge M	ix Values					
17.573 17.394 17.247 90th Percentile pH (SU) 8.436 91 17.414 17.247 90th Percentile pH (SU) 8.436 91 17.247 90th Percentile pH (SU) 8.436 91 17.232 91 17.23				Dry Season	Wet Season	Ammonia Mot Coscon Act	- the	Ammonia Mot Soason Chro	Soic
17.414 17.247 90th Percentile pH (SU) 8.436 8.392 8.436 (7.204 - pH) -1.232 8.436 (7.204 - pH) -1.232 8.436 (pH - 7.204) 1.2322 1.232 1.232 1.2322 1.2322 1.	1Q10 90th% 1	Temp. Mix (deg C)		17.573	17.394	AIIIIOIIId - TISL OSGSOII - ALL	<u> </u>	Allicollid - Wet deposit	
8.392 8.436 (7.204 - pH) -1.232 8.431 8.476 (pH - 7.204) 1.232 7.381 N/A Trout Present Criterion (mg N/l 3.524 Calculated Formula Inputs Trout Present?	30Q10 90th%	Temp. Mix (deg C)	_	17.414	17.247	90th Percentile pH (SU)	8.436	90th Percentile Temp. (deg C)	17.247
8.431 8.476 (ptl - 7.204) 1.232 7.381 N/A Trout Present Criterion (mg N/l 2.421 Trout Absent Criterion (mg N/l 3.624 Calcuiated Formula Inputs Trout Present? Calcuiated Formula Inputs Trout Present Criterion (mg N/L) 2.421	1Q10 90th% p	oH Mix (SU)		8.392	8.436	(7.204 - pH)	-1.232	90th Percentile pH (SU)	8.476
7.381 N/A Trout Present Criterion (mg N/ 3.421 7.385 N/A Trout Absent Criterion (mg N/ 3.524 Calculated Formula Inputs Trout Present? Y 25.000 25.000 Effective Criterion (mg N/L) 2.421 25.000 25.000	30Q10 90th%	pH Mix (SU)		8.431	8.476	(pH - 7.204)	1.232	NIM	2.390
7.385 N/A Trout Present Criterion (mg N/l 2.421 Trout Absent Criterion (mg N/l 3.524 Calculated Formula Inputs Trout Present? 25.000 25.000 Effective Criterion (mg N/L) 2.421	1Q10 10th% p	oH Mix (SU)		7.381	Ψ/Z			MAX	17.247
Calculated Formula Inputs Trout Absent Criterion (mg N/L 3.624 25.000 25.000 Effective Criterion (mg N/L) 2.421	7Q10 10th% t	oH Mix (SU)		7.385	N/A	Trout Present Criterion (mg N/I	2.421	(7.688 - pH)	-0.788
Calculated Formula Inputs Trout Present? y 25.000 25.000 Effective Criterion (mg N/L) 2.421 25.000 25.000						Trout Absent Criterion (mg N/L	3.624	(pH - 7.688)	0.788
25.000 25.000 Effective Criterion (mg N/L) 2.421 25.000 25.000				_	Formula Inputs	Trout Present?	>		
25.000 25.000	1Q10 Hardne	ss (mg/L as CaCO3	3)=	25.000	25.000	Effective Criterion (mg N/L)	2.421	Early LS Present Criterion (mg N	0.952
Early Life Stages Present?	7Q10 Hardne	ss (mg/L as CaCO3	=	25.000	25.000			Early LS Absent Criterion (mg N)	0.952
								Early Life Stages Present?	>
Effective Criterion (mg N/L)								Effective Criterion (mg N/L)	0.952

12/17/2007 9:50:09 AM

```
Facility = Mountain Lake Biological Station WWTP
Chemical = ammonia as N (mg/L)
Chronic averaging period = 30
WLAa = 7.2
WLAc = 1.8
Q.L. = 0.2
# samples/mo. = 1
# samples/wk. = 1
```

Summary of Statistics:

```
# observations = 1

Expected Value = 9

Variance = 29.16

C.V. = 0.6

97th percentile daily values = 21.9007

97th percentile 4 day average = 14.9741

97th percentile 30 day average = 10.8544

# < Q.L. = 0

Model used = BPJ Assumptions, type 2 data
```

A limit is needed based on Chronic Toxicity
Maximum Daily Limit = 3.63180616814936
Average Weekly limit = 3.63180616814936
Average Monthly Limit = 3.63180616814936

The data are:

9

Attachment G Water Quality Model Calculations

MEMORANDUM

DEPARTMENT OF ENVIRONMENTAL QUALITY West Central Regional Office

3019 Peters Creek Road

Roanoke, VA 24019

SUBJECT:

Mountain Lake Biological Station (VA0060321)

Modeling Results for Reissuance of VPDES Permit

TO:

Dale Phillips

Permit File

FROM:

Becky L. France

DATE:

February 6, 1998

Attached is the code and regional model output for the discharge from Mountain Lake Biological Station. This model was run to determine DO and BOD₅ limits for a receiving stream that has been reclassified as a trout stream.

The wastewater facility discharges to an unnamed intermittent tributary of Hunters Branch. This tributary eventually flows into Pond Drain about 1.17 miles from the discharge point. Based upon effluent monitoring data, the 90th percentile value for temperature is 19 °C. The stream velocity was derived using the MIX.EXE program found in Attachment G of the Statement of Basis. The reaeration coefficient (Ka), cBOD Decay Coefficient (K,), and nBOD Decay Coefficient (Kn) were modified to more accurately reflect stream conditions.

Model Inputs

Reaeration Coefficient (K.)

The Tsivoglou and Neal slope equation, as given in the User's Manual for the Regional Water Quality Model (Version 3.0), was used to determine the reaeration coefficient.

$$K_a = .025 (DH/1) * 24$$

where k_s = reaeration coefficient (/day) at 20 °C DH = change in elevation (ft) = 360 feet 1 = length of section (miles) = 1.17 miles

$$k_a$$
 at 20 °C = .025 (360/1.17) * 24 = 185 /day

The maximum standard default value for K_a used in the regional water quality model is 20/day because the Tsivoglou equation has no bounds for rapid changes in elevation. The restriction imposed upon the Tsivoglou equation are not appropriate for this stream. This stream is a fast moving mountain stream with an elevation change of 360 feet over 1.17 miles. The stream at 7Q10 conditions is estimated to be less than an inch deep and half a foot wide. Given these conditions, the stream can be expected to have a high reaeration rate. However, the reaeration coefficient given by the equation appears to be too high due to the stream bed characteristics. A reaeration coefficient of 185/day would be more characteristic of white water. No stream

studies were found for streams as shallow as the receiving stream. Of the stream studies reviewed, there were some k_a values approaching 40/day. Given the shallow stream and high velocity, a k_a of 40/day was chosen for the model.

Instream DO measurements taken below the discharge point in July of 1997 support the assumption of a high reaeration coefficient. The DO concentration of this stream was not significantly different from the background DO of a similar stream used as a control. A copy of the study results is found in Attachment E.

cBOD Decay Coefficient (K.)

Given a BOD₅ limit of 20 mg/l, no removal due to settling is expected. Using the recommendations found in the regional model manual, the stream bed characteristics, and the degree of treatment as guidelines, a rate of .9 /day at 20 °C was chosen for the model. For BOD, limits greater than 20 mg/l, a higher decay rate can be expected (1/day).

nBOD Decay Coefficient (K_n)

Based upon the recommended values given in the regional water quality manual, a value of .25/day was chosen for the model.

Other Assumptions

No impacts from benthic demand or photosynthesis were assumed in the model.

CBODu was used in the model based upon a cBODu/cBOD5 ratio of 2.5.

NBOD was based upon the equation converting the ammonia limit of 1.8 to nBOD as follows:

$$nBODu = (TKN - 3.0) \times 4.33$$

Results of Modeling

The model was run based upon discharge limits of BOD₅ = 20 mg/l, DO = 7.1 mg/l, and a nBOD of 7.79 mg/l. These values resulted in a DO that did not drop below 7.0 mg/l for the entire segment. Another model run with a BOD₅ of 20 mg/l and a DO of 7.0 mg/l resulted in violations of the water quality standard of 7.0 mg/l over the stream segment modeled.

After mixing with Pond Drain, the stream standard of 7.0 mg/l is easily maintained due to the dilution ratio of 11 to 1. Another 5 to 1 dilution is achieved when Pond Drain enters Little Stony Creek approximately 1.25 miles downstream.

The following effluent limits are predicted to protect water quality standards:

 $BOD_5 = 20 \text{ mg/l}$ TKN = 4.8 mg/lDO = 7.1 mg/l

MODEL SIMULATION FOR THE Mountain Lake Biological Station DISCHARGE TO UT to Hun

THE BACKGROUND CONDITIONS ARE:

FLOW = 0 MGD D.O. = 0 MG/L CBOD = 0 MG/L NBOD= 0 MG/L

OUTPUT WILL BE GENERATED EVERY .1 MILE FROM THE BEGINNING OF A SEGMENT

THE VARIABLES FOR SECTION 1 ARE:

The k rates shown are at 20 degrees C. The model corrects them.

Ka = 40 /DAY Kr = .9 /DAY Kn = .25 /DAY SATURATION D.O. = 8.103354 LENGTH = 1.17 MI VELOCITY = 6.2 MI/D TEMP. = 19 C ELEV. = 3600 P = 0 MG/L/D R = 0 MG/L/D BENTHIC DEMAND = 0 MG/L/D

FOR THE DISCHARGE AT THE BEGINNING OF THE SEGMENT:

FLOW = .009 MCD D.O. = 7.1 MG/L CBOD = 50 MG/L NBOD = 7.79 MG/L

THE RESULTS FOR SECTION 1 ARE

DISTANCE (MI) FROM HEAD OF SEGMENT	TOTAL DISTANCE (MI) FROM BEGINNING	D.O. (MG/L)	CBOD (MG/L)	NBOD (MG/L)
0	C	7.1	50	7.79
1	.1	7.037076	49.31156	7.76097
. 2	.2	7.010672	48.6326	7.732048
.3	.3	7.003621	47.96298	7.703233
. 4	. 4	7.00678	47.30259	7.674526
.5	.5	7.015284	46.65129	7.645926
.6	.6	7.026539	46.00895	7.617433
.7	. 7	7.039169	45.37546	7.589046
8000001	.8000001	7.052441	44.7507	7.560764
.9000001	.9000001	7.065965	44.13453	7.532588
1	1	7.079535	43.52685	7.504518
1.1	1.1	7.093042	42.92754	7.476551
1.17	1.17	7.102428	42.51294	7.457036
******	*********	*****	*****	*****

MODEL SIMULATION FOR THE Mountain Lake Biological Station DISCHARGE TO UT to Hun

THE BACKGROUND CONDITIONS ARE:

FLOW = 0 MGD D.O. = 0 MG/L CBOD = 0 MG/L NBOD= 0 MG/L

OUTPUT WILL BE GENERATED EVERY .1 MILE FROM THE BEGINNING OF A SEGMENT

THE VARIABLES FOR SECTION 1 ARE:

The k rates shown are at 20 degrees C. The model corrects them.

FOR THE DISCHARGE AT THE BEGINNING OF THE SEGMENT:

FLOW = .009 MGD D.O. = 7.2 MG/L CBOD = 52.5 MG/L NBOD = 7.79 MG

THE RESULTS FOR SECTION 1 ARE

DISTANCE (MI) FROM HEAD OF SEGMENT	TOTAL DISTANCE (MI) FROM BEGINNING	D.O. (MG/L)	CBOD (MG/L)	NBOD (MG/L)
0 .1 .2 .3 .4 .5 .6 .7 .8000001 .9000001	0 .1 .2 .3 .4 .5 .6 .7 .8000001 .9000001	7.2 7.005773 6.911509 6.870342 6.857317 6.859144 6.868747 6.882361 6.897982 6.914544 6.931483 6.9485	52.5 51.69744 50.90714 50.12893 49.36261 48.608 47.86494 47.13322 46.4127 45.70319 45.00453 44.31655	7.79 7.76097 7.732048 7.703233 7.674526 7.645926 7.617433 7.589046 7.560764 7.532588 7.504518 7.476551
1.17 ********	1.17	6.960369 ******	43.84123 ******	7.457036

SIMULATION COMPLETED

MODEL SIMULATION FOR THE Mountain Lake Biological State on DISCHARGE TO UT to Hun

THE BACKGROUND CONDITIONS ARE:

FLOW = 0 MGD D.O. = 0 MG/L CBOD = 0 MG/L NBOD= 0 MG/L

OUTPUT WILL BE GENERATED EVERY .1 MILE FROM THE BEGINNING OF A SEGMENT

THE VARIABLES FOR SECTION 1 ARE:

The k rates shown are at 20 degrees C. The model corrects them.

Ka = 40 /DAY Kr = .9 /DAY Kn = .25 /DAY SATURATION D.O. = 8.103354 LENGTH = 1.17 MI VELOCITY = 6.2 MI/D TEMP. = 19 C ELEV. = 3600 P = 0 MG/L/D R = 0 MG/L/D BENTHIC DEMAND = 0 MG/L/D

FOR THE DISCHARGE AT THE BEGINNING OF THE SEGMENT:

FLOW = .009 MGD D.O. = 7 MG/L CBOD = 50 MG/L NBOD = 7.79 MG/L

THE RESULTS FOR SECTION 1 ARE

DISTANCE (MI) FROM HEAD OF SEGMENT	TOTAL DISTANCE (MI) FROM BEGINNING	D.O. (MG/L)	(MG/L)	NBOD (MG/L)
o	0	7	50	7.79
.1	.1	6.983819	49.31156	7.76097
. 2	.2	6.982309	48.6326	7.732048
.3	.3	6.988515	47.96298	7.703233
. 4	.4	6.998735	47.30259	7.674526
.5	.5	7.010999	46.65129	7.645926
.6	.6	7.024258	46.00895	7.617433
.7	.7	7.037954	45.37546	7.589046
.8000001	.8000001	7.051794	44.7507	7.560764
.9000001	.9000001	7.06562	44.13453	7.532588
	1	7.079351	43.52685	7.504518
1	1.1	7.092944	42.92754	7.476551
1.1	1.17	7.102365	42.51294	7.457036
1.17		·************	*****	*****
*********	**************************************			

SIMULATION COMPLETED

```
10 CLS
30 OPEN "a:\bas.OUT" FOR GUTPUT AS #1
190 READ A$
200 READ BS
220 PRINT "**********************************
240 PRINT "THIS MODEL IS FOR THE "; A$; " DISCHARGE TO "; B$
250 PRINT
310 READ SEGS, XX
320 XT = XX
330 PRINT #1, "MODEL SIMULATION FOR THE "; A$; " DISCHARGE TO "; B$
340 PRINT #1,
360 READ QS, LS, NS, DOS
365 LBACK = LS: NBACK = NS: DBACK = DOS
370 PRINT #1,
380 PRINT #1,
390 PRINT #1, "THE BACKGROUND CONDITIONS ARE:"
400 PRINT #1, "-----"
410 PRINT #1, "FLOW ="; QS; " MGD D.O. ="; DOS; " MG/L CBOD ="; LS; " MG/L
420 PRINT #1,
430 PRINT #1, "OUTPUT WILL BE GENERATED EVERY "; XX; " MILE FROM THE BEGINNING O
440 PRINT #1,
460 FOR I = 1 TO SEGS
470 \text{ ZZ} = 1
480 READ QD, LD, ND, DOD
490 READ KA, KR, KN
500 READ X, U, TEMP, ELEV
510 READ P, R, B
520 SAT = 14.652 - .41022 * TEMP + .00799 * TEMP ^ 2 - 7.7774E-05 * TEMP ^ 3 + 7
530 SAT = SAT * (1! - .035 * ELEV / 1000)
540 PRINT #1, "THE VARIABLES FOR SECTION "; I; " ARE:"
550 PRINT #1,
             "The k rates shown are at 20 degrees C. The model corrects them."
560 PRINT #1,
570 PRINT #1,
             "Ka = "; KA; "/DAY Kr = "; KR; "/DAY Kn = "; KN; "/DAY SA
"LENGTH = "; X; " MI VELOCITY = "; U; " MI/D TEMP. = "; TEMP
" P = "; P; " MG/L/D R = "; R; " MG/L/D BENTHIC DEMAND = ";
580 PRINT #1,
590 PRINT #1,
600 PRINT #1,
610 PRINT #1,
620 PRINT #1,
630 PRINT #1,
             "FOR THE DISCHARGE AT THE BEGINNING OF THE SEGMENT:"
640 PRINT #1,
650 PRINT #1,
             "FLOW = "; QD; " MGD D.O. = "; DOD; " MG/L CBOD = "; LD; " M
660 PRINT #1,
670 PRINT #1,
680 PRINT #1,
              W______
690 PRINT #1,
700 PRINT #1,
                     THE RESULTS FOR SECTION "; I; " ARE"
710 PRINT #1,
720 PRINT #1,
                                                         CBOD
                                                                      NBOD "
                                           D.O.
                            TOTAL
             "DISTANCE
730 PRINT #1,
                                            (MG/L) (MG/L)
                                                                      (MG/L)
                        DISTANCE
740 PRINT #1,
             "(MI) FROM
                      (MI) FROM "
750 PRINT #1, "HEAD OF
                        BEGINNING "
760 PRINT #1, "SEGMENT
770 PRINT #1,
780 KA = KA * ((1.024) ^{\circ} (TEMP - 201))
790 KR = KR * ((1.047) ^{\circ} (TEMP - 201))
800 KN = KN * ((1.08) ^{\circ} (TEMP - 20!))
810 XY = XX
820 LM = ((QS * LS) + (QD * LD)) / (QS + QD)
```

```
830 NM = ((QS * NS) + (QD ND)) / (QS + QD)
840 \text{ DOM} = ((QS * DOS) + (QD * DOD)) / (QS + QD)
850 IF XT = 0 THEN ZT = 0
860 IF XT > 0 THEN ZT = XT - XX
870 PRINT #1, Z, ZT, DOM, LM, NM
890 DOX = SAT - DOM
900 EA = EXP(-KA * XY / U)
910 ER = EXP(-KR * XY / U)
920 EN = EXP(-KN * XY / U)
930 DD = DOX * EA
940 DL = LM * KR / (KA - KR) * (ER - EA)
950 DN = NM * KN / (KA - KN) * (EN - EA)
960 DB = B / KA * (1 - EA)
970 DR = R / KA * (1 - EA)
980 DP = -P / KA * (1 - EA)
990 DT = DD + DL + DN + DB + DR + DP
1060 DOSS = SAT - DT
1070 IF DOSS >= 0 THEN GOTO 1150
1080 PRINT #1,
              1090 PRINT #1,
1100 PRINT #1,
              " THE STREAM HAS GONE ANOXIC---SIMULATION TERMINATED"
1110 PRINT #1,
1120 PRINT #1,
              *************************
1130 PRINT #1,
1140 GOTO 9999
1150 LT = LM * ER
1160 NT = NM * EN
1163 IF LT <= LBACK THEN LT = LBACK: KR = 0
1164 IF NT <= NBACK THEN NT = NBACK: KN = 0
1170 PRINT #1, XY, XT, DOSS, LT, NT
1190 IF XY <= X - XX THEN GOTO 1220
1200 IF XY = X THEN GOTO 1280
1210 GOTO 1250
1220 \text{ XT} = \text{XT} + \text{XX}
1230 XY = XY + XX
1240 GOTO 900
1250 XT = XT + (X - XY)
1260 XY = X
1270 GOTO 900
1280 XT = XT + XX
1290 DOS = DOSS
1300 LS = LT
1310 \text{ NS} = \text{NT}
1320 QS = QS + QD
1345 PRINT #1, : PRINT #1,
1350 NEXT I
1360 PRINT #1,
1370 PRINT #1,
1380 PRINT #1, "SIMULATION COMPLETED
1390 CLOSE #1
1560 SYSTEM
1600 REM
1601 REM "THE DATA ARE AS FOLLOW: "
1602 REM "DATA LINE 1 -- NAME OF THE DISCHARGE"
1603 REM "DATA LINE 2 -- NAME OF THE STREAM"
1604 REM "DATA LINE 3 -- NUMBER OF SEGMENTS, CALCULATION INTERVAL (MI)"
1605 REM "DATA LINE 4--BACKGROUND Q (MGD), CBOD, NBOD AND D.O. (MG/L)"
1606 REM "DATA LINE 5--DISCHARGE Q (MGD), CBOD, NBOD AND D.O. (MG/L)"
1607 REM "DATA LINE 6--KA, KR AND KN (/DAY)"
```

```
1608 REM "DATA LINE 7--SE: INT LENGTH (MI), VELOCITY ( /DAY), TEMP (C) AND ELEVAT
1609 REM "DATA LINE 8--SEGMENT P,R AND BENTHIC DEMAND (MG/L/DAY)"
1610 REM "LINES 5, 6, 7 AND 8 ARE REPEATED FOR EACH SEGMENT"
1611 REM "DATA ITEMS ON THE SAME LINE ARE SEPARATED BY COMMAS"
1613 REM
2000 DATA "Mountain Lake Biological Station"
2010 DATA "UT to Hunters Branch"
2020 DATA 1, .1
2030 DATA 0,0,0,0
          DATA FOR SEGMENT 1
2035 REM
2040 DATA 0.009,50,7.79,7.1
2050 DATA 40,.9,.25
2060 DATA 1.17,6.2,19,3600
2070 DATA 0,0,0
          DATA FOR SEGMENT 2
2075 REM
2080 DATA 0,0,0,0
2090 DATA 15,0,0
2100 DATA 1,8.2,30,260
2110 DATA 0,0,0
```

9999 END

Attachment H

Public Notice

PUBLIC NOTICE - Environmental Permit

PURPOSE OF NOTICE: To seek public comment on a draft permit from the Department of Environmental Quality that will allow the release of treated wastewater into a water body in Giles County

PUBLIC COMMENT PERIOD: 30 days following the public notice issue date; comment period ends 4:30 pm of last day PERMIT NAME: Virginia Pollutant Discharge Elimination System – Wastewater issued by DEQ, under the authority of the State Water Control Board

NAME, ADDRESS, AND PERMIT NUMBER OF APPLICANT: University of Virginia, Facilities Management, PO Box 400726, Charlottesville, VA 22906-4726, VA0075361

NAME AND ADDRESS OF FACILITY: Mountain Lake Biological Stations WWTP, 335 Salt Pond Road, Pembroke, VA 24136-9724

PROJECT DESCRIPTION: University of Virginia has applied for a reissuance of a permit for their wastewater treatment plant in Giles County. The applicant proposes to release treated sewage at a rate of 0.009 MGD from the current facility into a water body. Sludge from the treatment process will be hauled to a local wastewater treatment plant. The facility proposes to release the treated sewage into the New River/ Little Stony Creek Watershed (VAW-N24R). A watershed is the land area drained by a river and its incoming streams. The permit will limit the following pollutants to amounts that protect water quality: nutrients, organic matter, solids.

HOW TO COMMENT: DEQ accepts comments by e-mail, fax, or postal mail. All comments must be in writing and be received by DEQ during the comment period. The public also may request a public hearing.

WRITTEN COMMENTS MUST INCLUDE: DEQ accepts comments by e-mail, fax, or postal mail. All comments must be in writing and be received by DEQ during the comment period. Written comments must include: 1) The names, mailing addresses, and telephone numbers of the person commenting and of all people represented by the citizen. 2) If a public hearing is requested, the reason for holding a hearing, including associated concerns. 3) A brief, informal statement regarding the extent of the interest of the person commenting, including how the operation of the facility or activity affects the citizen. DEQ may hold a public hearing, including another comment period, if a public response is significant and there are substantial, disputed issues relevant to the proposed permit. The public may review the draft permit and application at the DEQ office named below.

CONTACT OF PUBLIC COMMENTS, DOCUMENT REQUESTS, AND ADDITIONAL INFORMATION: NAME: Becky L. France; ADDRESS: Virginia Department of Environmental Quality, West Central Regional Office, 3019 Peters Creek Road, Roanoke, VA 24019-2738; PHONE: (540) 562-6700; E-MAIL ADDRESS: blfrance@deq.virginia.gov; FAX: (540) 562-6860

Attachment I

EPA Checksheet

State "FY2003 Transmittal Checklist" to Assist in Targeting Municipal and Industrial Individual NPDES Draft Permits for Review

Part I. State Draft Permit Submission Checklist

In accordance with the MOA established between the Commonwealth of Virginia and the United States Environmental Protection Agency, Region III, the Commonwealth submits the following draft National Pollutant Discharge Elimination System (NPDES) permit for Agency review and concurrence.

Fa	cility Name:	Mountain Lake 8	Biological Station WWTP			
NF	PDES Permit Number:	VA0075361				
Pe	rmit Writer Name:	Becky L. France				
Da	ite:	12/11/07				
R	Major[]	Minor [X]	Industrial []	Muni	cipal [K]
I.A	. Draft Permit Package S	ubmittal Includes	::	Yes	No	N/A
1.	Permit Application?			х		
2.	Complete Draft Permit (for including boilerplate inform		me permit – entire permit,	х		
3.	Copy of Public Notice?				Х	
4.	Complete Fact Sheet?			X		
5.	A Priority Pollutant Screen	ing to determine p	parameters of concern?			х
6.	A Reasonable Potential ar	nalysis showing ca	alculated WQBELs?	X		
7.	Dissolved Oxygen calcula	tions?		X		
8.	Whole Effluent Toxicity Te	st summary and a	nalysis?			х
9.	Permit Rating Sheet for ne	ew or modified ind	ustrial facilities?			X
I.B	. Permit/Facility Characte	eristics		Yes	No	N/A
1.	Is this a new, or currently	unpermitted facility	<i>l</i> ?		X	
2.	Are all permissible outfalls process water and storm vauthorized in the permit?	•	ned sewer overflow points, non- ility properly identified and	x		
3.	Does the fact sheet or per treatment process?	mit contain a des	cription of the wastewater	X		

I.B. Permit/Facility Characteristics – cont. (FY2003)	Yes	No	N/A
Does the review of PCS/DMR data for at least the last 3 years indicate significant non-compliance with the existing permit?		X	
5. Has there been any change in streamflow characteristics since the last permit was developed?		X	
6. Does the permit allow the discharge of new or increased loadings of any pollutants?		X	
7. Does the fact sheet or permit provide a description of the receiving water body(s) to which the facility discharges, including information on low/critical flow conditions and designated/existing uses?	X		
8. Does the facility discharge to a 303(d) listed water?		X	
a. Has a TMDL been developed and approved by EPA for the impaired water?			X
b. Does the record indicate that the TMDL development is on the State priority list and will most likely be developed within the life of the permit?			X
c. Does the facility discharge a pollutant of concern identified in the TMDL or 303(d) listed water?			X
9. Have any limits been removed, or are any limits less stringent, than those in the current permit?		X	
10. Does the permit authorize discharges of storm water?			X
11. Has the facility substantially enlarged or altered its operation or substantially increased its flow or production?		X	
12. Are there any production-based, technology-based effluent limits in the permit?		X	
13. Do any water quality-based effluent limit calculations differ from the State's standard policies or procedures?		X	
14. Are any WQBELs based on an interpretation of narrative criteria?		X	
15. Does the permit incorporate any variances or other exceptions to the State's standards or regulations?		X	
16. Does the permit contain a compliance schedule for any limit or condition?	X		
17. Is there a potential impact to endangered/threatened species or their habitat by the facility's discharge(s)?		X	
18. Have impacts from the discharge(s) at downstream potable water supplies been evaluated?			X
19. Is there any indication that there is significant public interest in the permit action proposed for this facility?		X	
20. Have previous permit, application, and fact sheet been examined?	X		

Part II. NPDES Draft Permit Checklist (FY2003)

Region III NPDES Permit Quality Checklist – for POTWs (To be completed and included in the record <u>only</u> for POTWs)

IJ.,	A. Permit Cover Page/Administration	Yes	No	N/A
1.	Does the fact sheet or permit describe the physical location of the facility, including latitude and longitude (not necessarily on permit cover page)?	x		
2.	Does the permit contain specific authorization-to-discharge information (from where to where, by whom)?	X		

II.B. Effluent Limits – General Elements		No	N/A
 Does the fact sheet describe the basis of final limits in the permit (e.g., that a comparison of technology and water quality-based limits was performed, and the most stringent limit selected)? 	X		
Does the fact sheet discuss whether "antibacksliding" provisions were met for any limits that are less stringent than those in the previous NPDES permit?			X

11.0	C. Technology-Based Effluent Limits (POTWs)	Yes	No	N/A
1.	Does the permit contain numeric limits for <u>ALL</u> of the following: BOD (or alternative, e.g., CBOD, COD, TOC), TSS, and pH?	X		
2.	Does the permit require at least 85% removal for BOD (or BOD alternative) and TSS (or 65% for equivalent to secondary) consistent with 40 CFR Part 133?	Х		
_	a. If no, does the record indicate that application of WQBELs, or some other means, results in more stringent requirements than 85% removal or that an exception consistent with 40 CFR 133.103 has been approved?			X
3.	Are technology-based permit limits expressed in the appropriate units of measure (e.g., concentration, mass, SU)?	X		
4.	Are permit limits for BOD and TSS expressed in terms of both long term (e.g., average monthly) and short term (e.g., average weekly) limits?	X		
5.	Are any concentration limitations in the permit less stringent than the secondary treatment requirements (30 mg/l BOD5 and TSS for a 30-day average and 45 mg/l BOD5 and TSS for a 7-day average)?		X	
	a. If yes, does the record provide a justification (e.g., waste stabilization pond, trickling filter, etc.) for the alternate limitations?			X

II.D. Water Quality-Based Effluent Limits	Yes	No	N/A
Does the permit include appropriate limitations consistent with 40 CFR 122.44(d) covering State narrative and numeric criteria for water quality?	X		
Does the fact sheet indicate that any WQBELs were derived from a completed and EPA approved TMDL?			X

11.8	D. Water Quality-Based Effluent Limits – cont. (FY2003)	Yes	No	N/A
3.	Does the fact sheet provide effluent characteristics for each outfall?	X		
4.	Does the fact sheet document that a "reasonable potential" evaluation was performed?	X		
	a. If yes, does the fact sheet indicate that the "reasonable potential" evaluation was performed in accordance with the State's approved procedures?	X		
	b. Does the fact sheet describe the basis for allowing or disallowing in-stream dilution or a mixing zone?	X		
	c. Does the fact sheet present WLA calculation procedures for all pollutants that were found to have "reasonable potential"?	X		
	d. Does the fact sheet indicate that the "reasonable potential" and WLA calculations accounted for contributions from upstream sources (i.e., do calculations include ambient/background concentrations)?			X
	e. Does the permit contain numeric effluent limits for all pollutants for which "reasonable potential" was determined?	X		
5.	Are all final WQBELs in the permit consistent with the justification and/or documentation provided in the fact sheet?	X		
6.	For all final WQBELs, are BOTH long-term AND short-term effluent limits established?	X		
7.	Are WQBELs expressed in the permit using appropriate units of measure (e.g., mass, concentration)?	X		
8.	Does the record indicate that an "antidegradation" review was performed in accordance with the State's approved antidegradation policy?	X		

II.E. Monitoring and Reporting Requirements	Yes	No	N/A
1. Does the permit require at least annual monitoring for all limited para and other monitoring as required by State and Federal regulations?	ameters X		
a. If no, does the fact sheet indicate that the facility applied for and v granted a monitoring waiver, AND, does the permit specifically ind this waiver?			X
2. Does the permit identify the physical location where monitoring is to performed for each outfall?	be X		
3. Does the permit require at least annual influent monitoring for BOD alternative) and TSS to assess compliance with applicable percent requirements?		x	
4. Does the permit require testing for Whole Effluent Toxicity?		X	

II.F. Special Conditions	Yes	No	N/A
Does the permit include appropriate biosolids use/disposal requirements?	X		
Does the permit include appropriate storm water program requirements?			X

11.1	. Special Conditions – cont. (FY2003)	Yes	No	N/A
3.	If the permit contains compliance schedule(s), are they consistent with statutory and regulatory deadlines and requirements?	X		
4.	Are other special conditions (e.g., ambient sampling, mixing studies, TIE/TRE, BMPs, special studies) consistent with CWA and NPDES regulations?	X		
5.	Does the permit allow/authorize discharge of sanitary sewage from points other than the POTW outfall(s) or CSO outfalls [i.e., Sanitary Sewer Overflows (SSOs) or treatment plant bypasses]?			X
6.	Does the permit authorize discharges from Combined Sewer Overflows (CSOs)?			X
	a. Does the permit require implementation of the "Nine Minimum Controls"?			X
	b. Does the permit require development and implementation of a "Long Term Control Plan"?			X
	c. Does the permit require monitoring and reporting for CSO events?			X
7.	Does the permit include appropriate Pretreatment Program requirements?			X

II.G. Standard Conditions	Yes	No	N/A
Does the permit contain all 40 CFR 122.41 standard conditions or the State equivalent (or more stringent) conditions?	X		
List of Standard Conditions – 40 CFR 122.41	_		

Duty to comply Duty to reapply Need to halt or reduce activity not a defense Duty to mitigate
Proper O & M Permit actions

Property rights
Duty to provide information
Inspections and entry
Monitoring and records
Signatory requirement
Bypass
Upset

Reporting Requirements
Planned change
Anticipated noncompliance
Transfers
Monitoring reports
Compliance schedules
24-Hour reporting
Other non-compliance

е	Does the permit contain the additional standard condition (or the State equivalent or more stringent conditions) for POTWs regarding notification of ew introduction of pollutants and new industrial users [40 CFR 122.42(b)]?		x	
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Part II. NPDES Draft Permit Checklist (FY2003)

Region III NPDES Permit Quality Review Checklist – For Non-Municipals (To be completed and included in the record for all non-POTWs)

(10 be completed and included in the record for <u>all</u> fron-r-O i	vvs/	
		_

11.4	A. Permit Cover Page/Administration	Yes	No	N/A
1.	Does the fact sheet or permit describe the physical location of the facility, including latitude and longitude (not necessarily on permit cover page)?			
2.	Does the permit contain specific authorization-to-discharge information (from where to where, by whom)?			

II.B. Effluent Limits – General Elements		No	N/A
Does the fact sheet describe the basis of final limits in the permit (e.g., that a comparison of technology and water quality-based limits was performed, and the most stringent limit selected)?		-	
Does the fact sheet discuss whether "antibacksliding" provisions were met for any limits that are less stringent than those in the previous NPDES permit?			_

II.C. Technology-Based Effluent Limits (Effluent Guidelines & BPJ)			No	N/A
1.	Is the facility subject to a national effluent limitations guideline (ELG)?			-
	a. If yes, does the record adequately document the categorization process, including an evaluation of whether the facility is a new source or an existing source?			
	b. If no, does the record indicate that a technology-based analysis based on Best Professional Judgement (BPJ) was used for all pollutants of concern discharged at treatable concentrations?			
2.	For all limits developed based on BPJ, does the record indicate that the limits are consistent with the criteria established at 40 CFR 125.3(d)?			
3.	Does the fact sheet adequately document the calculations used to develop both ELG and /or BPJ technology-based effluent limits?			
4.	For all limits that are based on production or flow, does the record indicate that the calculations are based on a "reasonable measure of ACTUAL production" for the facility (not design)?			
5.	Does the permit contain "tiered" limits that reflect projected increases in production or flow?			
	a. If yes, does the permit require the facility to notify the permitting authority when alternate levels of production or flow are attained?			
6.	Are technology-based permit limits expressed in appropriate units of measure (e.g., concentration, mass, SU)?			

II.C. Technology-Based Effluent Limits (Effluent Guidelines & BPJ) - cont.	Yes	No	N/A
7. Are all technology-based limits expressed in terms of both maximum daily, weekly average, and/or monthly average limits?			
Are any final limits less stringent than required by applicable effluent limitations guidelines or BPJ?			

II.D. Water Quality-Based Effluent Limits			No	N/A
1.	Does the permit include appropriate limitations consistent with 40 CFR 122.44(d) covering State narrative and numeric criteria for water quality?			
2.	Does the record indicate that any WQBELs were derived from a completed and EPA approved TMDL?			
3.	Does the fact sheet provide effluent characteristics for each outfall?			
4.	Does the fact sheet document that a "reasonable potential" evaluation was performed?			
	a. If yes, does the fact sheet indicate that the "reasonable potential" evaluation was performed in accordance with the State's approved procedures?			
	b. Does the fact sheet describe the basis for allowing or disallowing in-stream dilution or a mixing zone?			
	c. Does the fact sheet present WLA calculation procedures for all pollutants that were found to have "reasonable potential"?			
	d. Does the fact sheet indicate that the "reasonable potential" and WLA calculations accounted for contributions from upstream sources (i.e., do calculations include ambient/background concentrations where data are available)?			
	e. Does the permit contain numeric effluent limits for all pollutants for which "reasonable potential" was determined?			
5.	Are all final WQBELs in the permit consistent with the justification and/or documentation provided in the fact sheet?			
6.	For all final WQBELs, are BOTH long-term (e.g., average monthly) AND short-term (e.g., maximum daily, weekly average, instantaneous) effluent limits established?			
7.	Are WQBELs expressed in the permit using appropriate units of measure (e.g., mass, concentration)?			
8.	Does the fact sheet indicate that an "antidegradation" review was performed in accordance with the State's approved antidegradation policy?			

FY2003

. Monitoring and Reporting	Requirements (FY2003)		Yes	No	N/A
Does the permit require at lea	st annual monitoring for all limited p	parameters?			
•	• • • •				
Does the permit identify the pl performed for each outfall?	nysical location where monitoring is	to be			
		ordance with			
. Special Conditions			Yes	No	N/A
	•	est			
a. If yes, does the permit adec the BMPs?	uately incorporate and require com	pliance with			
		t with			
6. Standard Conditions			Yes	No	N/A
<u>-</u>		or the State			
t of Standard Conditions – 4	0 CFR 122.41				
ty to comply ty to reapply ed to halt or reduce activity not a defense ty to mitigate oper O & M rmit actions	Property rights Duty to provide information Inspections and entry Monitoring and records Signatory requirement Bypass Upset	Planned Anticipat Transfer Monitorir Complia 24-Hour	ed change lated noncompliance ers laring reports liance schedules		
	a. If no, does the fact sheet ingranted a monitoring waive this waiver? Does the permit identify the pherformed for each outfall? Does the permit require testing the State's standard practices. Special Conditions Does the permit require devel Management Practices (BMP) a. If yes, does the permit adec the BMPs? If the permit contains compliant statutory and regulatory deadly Are other special conditions (BMPs, special studies) consists. Standard Conditions Does the permit contain all 40 equivalent (or more stringent) at of Standard Conditions — 4 ty to comply ty to reapply ed to halt or reduce activity not a defense ty to mitigate oper O & M	a. If no, does the fact sheet indicate that the facility applied for an granted a monitoring waiver, AND, does the permit specifically this waiver? Does the permit identify the physical location where monitoring is performed for each outfall? Does the permit require testing for Whole Effluent Toxicity in acceptable the State's standard practices? Special Conditions Does the permit require development and implementation of a Be Management Practices (BMP) plan or site-specific BMPs? a. If yes, does the permit adequately incorporate and require compact the BMPs? If the permit contains compliance schedule(s), are they consistent statutory and regulatory deadlines and requirements? Are other special conditions (e.g., ambient sampling, mixing stud BMPs, special studies) consistent with CWA and NPDES regulated and the permit contain all 40 CFR 122.41 standard conditions are equivalent (or more stringent) conditions? Standard Conditions — 40 CFR 122.41 Ty to comply to reapply property rights puty to reapply puty to provide information Inspections and entry mot a defense put to mitigate Signatory requirement bypass	Does the permit require at least annual monitoring for all limited parameters? a. If no, does the fact sheet indicate that the facility applied for and was granted a monitoring waiver, AND, does the permit specifically incorporate this waiver? Does the permit identify the physical location where monitoring is to be performed for each outfall? Does the permit require testing for Whole Effluent Toxicity in accordance with the State's standard practices? Special Conditions Does the permit require development and implementation of a Best Management Practices (BMP) plan or site-specific BMPs? a. If yes, does the permit adequately incorporate and require compliance with the BMPs? If the permit contains compliance schedule(s), are they consistent with statutory and regulatory deadlines and requirements? Are other special conditions (e.g., ambient sampling, mixing studies, TIE/TRE, BMPs, special studies) consistent with CWA and NPDES regulations? Standard Conditions Does the permit contain all 40 CFR 122.41 standard conditions or the State equivalent (or more stringent) conditions? At of Standard Conditions – 40 CFR 122.41 Ty to comply Property rights Reporting R by to reapply Duty to provide information Planned on the lot of that or reduce activity Inspections and entry Anticipating Complia Signatory requirement Monitor Deper O & M Bypass Complia 24-Hour Monitoring and records Upset 24-Hour	Does the permit require at least annual monitoring for all limited parameters? a. If no, does the fact sheet indicate that the facility applied for and was granted a monitoring waiver, AND, does the permit specifically incorporate this waiver? Does the permit identify the physical location where monitoring is to be performed for each outfall? Does the permit require testing for Whole Effluent Toxicity in accordance with the State's standard practices? Special Conditions Yes Does the permit require development and implementation of a Best Management Practices (BMP) plan or site-specific BMPs? a. If yes, does the permit adequately incorporate and require compliance with the BMPs? If the permit contains compliance schedule(s), are they consistent with statutory and regulatory deadlines and requirements? Are other special conditions (e.g., ambient sampling, mixing studies, TIE/TRE, BMPs, special studies) consistent with CWA and NPDES regulations? S. Standard Conditions Does the permit contain all 40 CFR 122.41 standard conditions or the State equivalent (or more stringent) conditions? At of Standard Conditions – 40 CFR 122.41 by to comply Property rights Duty to provide information Planned change Anticipated none of the proper of the provide and requirement Signatory requirement Signatory requirement Monitoring and records Transfers Monitoring report Compliance schemit actions Upset 24-Hour reporting	Does the permit require at least annual monitoring for all limited parameters? a. If no, does the fact sheet indicate that the facility applied for and was granted a monitoring waiver, AND, does the permit specifically incorporate this waiver? Does the permit identify the physical location where monitoring is to be performed for each outfall? Does the permit require testing for Whole Effluent Toxicity in accordance with the State's standard practices? Special Conditions Yes No Does the permit require development and implementation of a Best Management Practices (BMP) plan or site-specific BMPs? a. 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Part III. Signature Page (FY2003)

Based on a review of the data and other information submitted by the permit applicant, and the draft permit and other administrative records generated by the Department/Division and/or made available to the Department/Division, the information provided on this checklist is accurate and complete, to the best of my knowledge.

Name	Becky L. France
Title	Environmental Engineer Senior
Signature	Becky & France
Date	12/11/07